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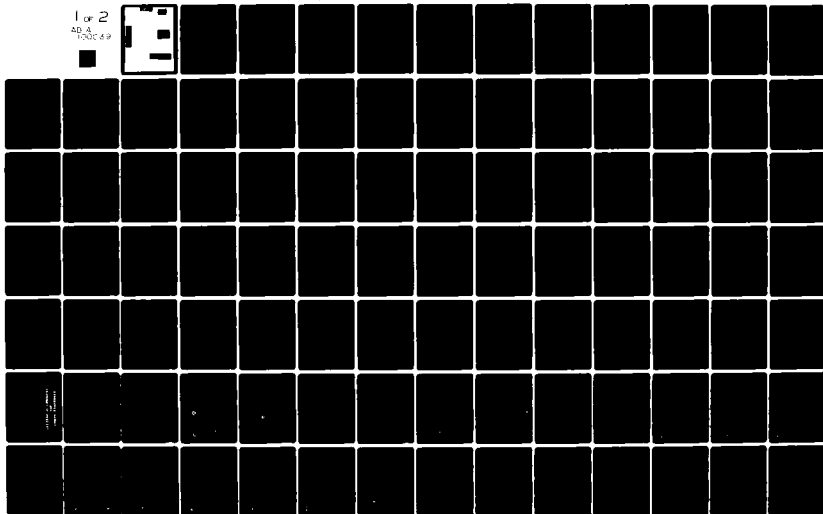
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REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
AD-A100039		
4. TITLE (and Subtitle)	5. TYPE OF REPORT & PERIOD COVERED	
Final Environmental Impact Statement Lake Superior Harbors of Refuge at Lutsen and Beaver Bay Cook And Lake Counties Minnesota.	Final Report	
7. AUTHOR(s)	6. PERFORMING ORG. REPORT NUMBER	
U.S. Army Engineer District Detroit	7. CONTRACT OR GRANT NUMBER(s)	
9. PERFORMING ORGANIZATION NAME AND ADDRESS	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS	
Department of the Army U.S. Army Engineer District, Detroit P.O. Box 1027, Detroit, Michigan 48231		
11. CONTROLLING OFFICE NAME AND ADDRESS	12. REPORT DATE	
154	December 1977	
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)	13. NUMBER OF PAGES	
	148 p. (Various pagings)	
	15. SECURITY CLASS. (of this report)	
	UNCLASSIFIED	
	15a. DECLASSIFICATION/DOWNGRADING SCHEDULE	
16. DISTRIBUTION STATEMENT (of this Report)		
Approved for public release; distribution unlimited.		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number)		
Dredged Materials Groundwater Dredging Contamination Land Disposal Disposal Facility Harbor Water Quality Breakwater		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number)		
<p>This document describes the proposed harbor of refuge at Lutsen and Beaver Bay along Lake Superior. Alternative sites were considered at Silver Bay and Schroeder, Minnesota. The proposed harbor would provide shelter for recreational boating crafts, mooring sites, and vessel service facilities.</p> <p>Unavoidable adverse environmental and biological effects of the project are described due to dredging, dredge material disposal, land use, and</p> <p style="text-align: right;">(Continued)</p>		

20, ABSTRACT (Continued)

✓construction of breakwaters. However, other disposal methods are proposed and coordinated with state and federal agencies in accordance with applicable federal laws. Natural resources such as fuels and construction materials would be expended during construction, breakwater repair and disposal operations. ✓

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FINAL
ENVIRONMENTAL IMPACT STATEMENT
HARBORS-OF-REFUGE
LUTSEN AND BEAVER BAY, MINNESOTA
LAKE SUPERIOR

DISTRIBUTION STATEMENT A

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U.S. ARMY CORPS OF ENGINEERS
St. Paul District
December 1977

FOREWORD

The proposed harbor-of-refuge projects at Lutsen and Beaver Bay are described in House Document 446-78-2 and were authorized under the provision of the 1945 River and Harbor Act. This environmental impact statement has been prepared in accordance with the requirements, of the National Environmental Policy Act of 1969 (NEPA) and, therefore, attempts to identify the environmental, economic, and social impacts associated with the project.

The authorized harbor-of-refuge sites at both Lutsen and Beaver Bay are no longer available due to extensive private developments. Accordingly, alternate locations which would fulfill the purpose of the authorized projects were selected. The relocation of the harbor sites is considered to be within the discretionary authority of the Chief of Engineers. The proposed alternate site of the Lutsen harbor-of-refuge is located at Schroeder, Minnesota. The proposed alternate site for the Beaver Bay harbor-of-refuge is located at Silver Bay, Minnesota.

The draft environmental impact statement for the proposed projects was furnished to the public in December 1974. The draft identified the various alternatives to the proposed action. At the time the proposed alternate site for the Lutsen harbor-of-refuge was located 2.6 miles northeast of the authorized site. Further engineering studies indicated that the site was infeasible due to engineering and economic factors. Therefore, the alternate site at Schroeder was selected.

The draft environmental statement was presented to the public in an effort to obtain their comments on the proposed project and the various alternatives. This final environmental impact statement includes all the comments received to date. Some of the comments have led to modification of the proposed plan. The proposed disposal plan in the draft EIS was dump dredge material in designated dump zones outside of the harbor areas in a deep area of Lake Superior. Current plans include the utilization of excavated rock material from the Silver Bay harbor site for shore protection purposes and utilization of excavated material from Schroeder as land fill in the adjacent shore area. Excess and unsuitable material dredged from the two harbor areas would be deposited in proposed on-land disposal sites described in this document. All disposal plans will continue to be closely coordinated with appropriate Federal and State agencies.

Current plans now also include some recreation resource development at both harbor sites (see section 1 of this report) in accordance with current Federal laws and Corps of Engineer policies. However, since no recreation studies have been previously authorized or conducted at these proposed projects, the proposed recreation development will be presented to the Chief of Engineers and Congress in a Post Authorization Change Letter. If the recreation proposals are accepted, they will be represented and refined in future planning documents. See paragraphs 4.74, 4.75, 4.76, and 4.87 for additional discussion of the specific impacts of recreational development.

The public should be aware that the present plan is not absolute but is still subject to change due to further study results and the consensus of public opinion. This statement will be filed with the United States Environmental Protection Agency and noted as availability for review in the Federal Register. When the notice of availability appears, a final 30-day review period will commence.

Phase II studies which entail the design and engineering studies needed to implement the planned concepts are nearly completed and are scheduled to be submitted to higher Corps offices for approval in February 1978. Preparation of plans and specifications has been initiated but is subject to change until the review period for the document is over and it has been approved.

Coordination with all known interests is a continuing process and attempts to continue this coordination are being made (see section 9 for more detailed information).

Single copies of this report are available at the Corps of Engineers St. Paul District Office, 1135 U.S. Post Office and Custom House, St. Paul, Minnesota 55101.

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SUMMARY ENVIRONMENTAL STATEMENT
HARBORS-OF-REFUGE
LUTSEN AND BEAVER BAY, MINNESOTA
LAKE SUPERIOR

☐ Draft ☒ Final Environmental Statement

1. Name of Action: ☒ Administrative ☐ Legislative

2. Description of Action: The proposed action is the construction of harbors-of-refuge at Lutsen and Beaver Bay, Minnesota, and their operation and maintenance.

3. a. Environmental Impacts: The proposed harbors would help provide a continuous system of harbors-of-refuge for small craft along the north shore of Lake Superior at intervals of 30 to 40 miles. These harbors are defined as harbors developed primarily to afford shelter preservation of vessel and safety of crew. The harbors would also provide some mooring sites and vessel service facilities for local boat-owners.

b. Adverse Environmental Effects: Structures necessary at the Lutsen site (Schroeder) would cover 3 acres of existing lake bottom and about a tenth of an acre of land area, and approximately 2,890 cubic yards of material would have to be dredged from the harbor basin encompassing an area of approximately 1.5 acres. At the Beaver Bay (Silver Bay) site the necessary structures would cover 0.5 acres of existing lake bottom and 0.05 acre of land area. Initial dredging would remove approximately 13,637 cubic yards of material from the harbor basin encompassing approximately 2 acres. In addition, an indeterminate amount of lake bottom and land area would be utilized for project induced secondary developments and, if approved, recreational facilities consisting of a boat access, a restroom, and picnic and parking facilities for both proposed harbors. The construction of the breakwaters would have an adverse impact on the aesthetic values through the introduction of straight line features into natural coves. Dredging would cause turbidity in the immediate vicinity of the dredge. Benthic dwelling organisms would be removed and disrupted during the dredging operation. Following construction little or no maintenance dredging of the project is anticipated. Proposed disposal plans currently include utilization of excavated rock material from the Silver Bay site for shore protection purposes and utilization of excavated material from the Schroeder site as land fill in the adjacent shore area. Excess and unsuitable material dredged from the two harbor areas would be deposited in the proposed on-land disposal sites. However, final disposal methods will be fully coordinated with State and Federal agencies in accordance with applicable Federal laws. Natural resources, such as fuels and construction materials, would be expended during construction, break-water repair and disposal operations.

4. Alternatives:

- a. No action
- b. Alternate sites
- c. Disposal alternatives

5. a. Comments requested: See page 56 for a list of those furnished a copy of the draft Environmental Statement.

b. Comments received: See page 56 for a list of those who furnished comments on the draft statement.

6. a. Draft Statement to CEQ: 17 January 1975

b. Final Statement to CEQ: _____

FINAL
ENVIRONMENTAL IMPACT STATEMENT
HARBORS-OF-REFUGE
LUTSEN AND BEAVER BAY, MINNESOTA
LAKE SUPERIOR

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FINAL
ENVIRONMENTAL IMPACT STATEMENT
HARBORS-OF-REFUGE
LUTSEN AND BEAVER BAY, MINNESOTA
LAKE SUPERIOR

1. PROJECT DESCRIPTION

PROJECT PURPOSE

1.01 The proposed harbors are authorized to serve one basic function, that of harbors-of-refuge for light draft recreational and commercial fishing vessels. The need set forth in the 1945 pre-authorization study was for a continuous system of harbors-of-refuge for small craft along the Great Lakes shore at intervals of 30 to 40 miles. The average small craft was assumed to have a safe cruising distance of 30 miles, which was the determining factor in the spacing of harbors-of-refuge. Sites were then selected, which, when considered with existing adequate harbors, would provide the desired system. Harbor construction at Lutsen and Beaver Bay was recommended in view of their locations in relationship to this proposed system of harbors on the entire American portion of the Lake Superior shoreline. The nearest federally improved harbors to the Lutsen and Beaver Bay authorized sites are at Two Harbors and Grand Marais. Two Harbors is 27 miles southwest of Beaver Bay and 69 miles southwest of Lutsen, while Grand Marais is 56 miles northeast of Beaver Bay and 19 miles northeast of Lutsen. Boats using Beaver Bay Harbor would primarily come from the Minnesota and Wisconsin shores of Lake Superior plus transient traffic around the remainder of the lake.

1.02 Harbors-of-refuge for light draft vessels are defined as harbors developed primarily to afford shelter to vessels caught in unexpected storms and forced to seek refuge for preservation of vessel and safety of crew. Small craft, caught in a sudden storm, or not receiving or heeding ample storm warning, would safely reach the harbors only from a short distance on the lake, however. The spacing of the harbors renders them more adequate as safe berthing places. Provision of harbors-of-refuge is considered to be distinct from development of new or existing harbors principally intended to be the home ports of recreational craft or as bases used by commercial fishermen. It is also distinct from provision of facilities solely for mooring, wintering, repairing, fueling and provisioning of small boats.

PROJECT LOCATION

1.03 Both Lutsen and Beaver Bay are located on the north shore of Lake

Superior. Lutsen is located in Cook County, Minnesota, approximately 90 miles northeast of Duluth. Beaver Bay is in Lake County, Minnesota, about 53 miles northeast of Duluth. Lutsen lies at latitude $47^{\circ}39.1'N$ and longitude $90^{\circ}40.5'W$; Beaver Bay lies at latitude $47^{\circ}15.5'N$ and longitude $91^{\circ}18.3'W$. (See exhibit 1, page A-1.)

1.04 The authorized sites at both Lutsen and Beaver Bay are no longer available as harbors-of-refuge due to extensive private developments. Accordingly, alternate locations have been chosen. The relocation of the harbor sites is considered to be within the discretionary authority of the Chief of Engineers.

1.06 The proposed alternate site for Beaver Bay is located at Silver Bay approximately 1 mile northeast of Beaver Bay. (See exhibit 3, page A-3.)

PROJECT AUTHORIZATION

1.07 The proposed harbor-of-refuge projects at Lutsen and Beaver Bay are described in House Document 446-78-2 and were authorized under the provision of the 1945 River and Harbor Act. The authorized project at Lutsen provides for two converging breakwaters, the easterly breakwater 240 feet long and the westerly 425 feet long; a flared entrance channel 12 feet deep with a minimum width of 60 feet; an east inner channel, 100 feet wide, 8 feet deep, and 215 feet long; and a west inner channel, 50 feet wide, 6 feet deep and 255 feet long. The authorized Beaver Bay project provides for construction of 550 feet of rubble-mound breakwater and dredging of a harbor basin, 12 feet deep and approximately 2.2 acres in size.

1.08 Under project authorization for the harbors-of-refuge at both Lutsen and Beaver Bay local interests are required to:

a. Make a cash contribution toward the first cost of the protective structure and dredging. This cash contribution is fixed at \$66,785 for Lutsen and \$38,875 for Beaver Bay;

b. Provide and maintain, without cost to the United States and in accordance with plans approved by the Chief of Engineers, a suitable and adequate public wharf for the accommodation of transient vessels;

c. Establish a competent and properly constituted public body which is empowered to regulate the use, growth, and free development of all harbor facilities on a nonprofit basis and in the best interest of the public;

d. Hold and save the United States free from damages due to the construction and maintenance of the works, except for damages due to the fault or negligence of the government or its contractors.

e. Provide without cost to the United States all lands, easements, and rights-of-way necessary for the construction of the projects, including suitable dredge material disposal areas when and as required.

PROPOSED PROJECT PLAN - LUTSEN (SCHROEDER)

1.09 The alternate site for the authorized Lutsen harbor is located about one-quarter mile east of the Cross River in the town of Schroeder and about 11 miles southwest of the authorized site. The alternate site would utilize a bay about 650 feet wide and 200 feet deep. Breakwaters and some rock excavation would be required. Ample area for parking and service facilities is available. The plan considered most feasible to accomplish the authorized function includes two breakwaters, an excavated harbor basin, and provision of navigation aids.

1.10 The breakwaters would be of rubblemound construction, except that steel sheet-piling cells, filled with granular fill and capped with grouted rock would be placed at each side of the harbor entry. The alignment of the breakwaters would be situated to place the main breakwater somewhat parallel to the shore and at the edge of a shelf which terminates in a drop-off to deeper water. The two breakwaters would tie into shore, one on each side of the bay. The east breakwater would extend into the lake in a south-easterly direction approximately 330 feet. The breakwater would then bend in a more southerly direction and continue for a length of another 220 feet. The west breakwater would extend in an easterly direction for a length of approximately 720 feet and then would turn in a northerly direction and continue for another 140 feet. The width of the entrance has been set at 130 feet clear. The west rubblemound breakwater would have a crest width of 27.0 feet for its entire length. The east breakwater would have a crest width varying from 20.0 feet at station 0+50 to 27.0 feet at station 3+52. The remainder of the east breakwater would have a 27.0-foot wide crest. Both breakwaters would have 1 vertical on 2 horizontal side slopes and both breakwaters would have for their entire lengths an elevation of +9.0 feet above low water datum 600.00 IGLD 1955. Rubblemound breakwaters were chosen because they are most cost effective in water depths up to about 18 or 19 feet. The average depth along the proposed alignments is about 16 to 18 feet. Steel sheet-piling cells are contemplated at the entrance because of lower construction costs and because of the safer entry the vertical walls would provide at the harbor entrance channel.

1.11 The harbor basin would have a total area of about 5.25 acres. Harbor excavation would be to a depth of 8 feet where lake bottom material can be removed without blasting and to depths of 4 or 5 feet in the area closer to shore where ledge rock would not be excavated. Approximately 2.66 acres could be used for berthing or mooring in water 8 feet or deeper. This area would include the harbor entrance, the harbor turning area and the major maneuvering and permanent berthing area. Approximately 2.59 acres are available for mooring and berthing in water less than 8 feet deep. (See proposed project, exhibit 4, page A-4). The harbor is designed to a capacity equaling that of the project document; therefore, the new plans do not conflict with the authorized project.

PROPOSED PROJECT PLAN-BEAVER BAY (SILVER BAY)

1.12 The alternate site for the authorized Beaver Bay harbor is located at Silver Bay, approximately 1 mile northeast of the authorized site. The proposed harbor site would be on the westerly side of Reserve Mining's west breakwater at Silver Bay. The plan considered most feasible to accomplish the authorized function includes two breakwaters of steel sheet piling cell and rubblemound construction, an excavated harbor basin and the provision of navigation aids.

1.13 The alignment of the proposed breakwaters generally follows the 22-foot bottom contours. The easterly breakwater would be tied into Reserve Mining Company's west breakwater with an appropriate 100-foot rubblemound connection and extend with three cells in a westerly direction of about 100 feet. The westerly breakwater would tie into a promontory at the west side of the harbor with a 90-foot rubblemound connection and extend northeasterly with 11 cells approximately 400 feet. The harbor entrance between the two breakwaters would be 130 feet wide.

1.14 The major portion of the breakwater would be built using steel sheet pile cells filled with granular fill and capped with grouted rock. The top of the entire breakwater lengths would have a +10.0 feet above low water datum elevation. The steel cells would have a diameter of 35.65 feet using PSA-23 steel sheet pile. The rubblemound sections would have a 26-foot crest with side sloped 1 vertical on 1.5 horizontal. It is recognized that steel sheet piling would be less aesthetic to most people than rubblemound and that it would provide a substrate of lower quality for aquatic life. However, a steel cell breakwater design was chosen because it would more effectively and economically meet the requirements and site conditions for this harbor than would any other type of breakwater. A steel cell breakwater would eliminate the possibility of wave transmission, a critical factor in this harbor because the mooring area is located immediately behind the breakwater.

1.15 The harbor basin would have a total area of about 6 acres; approximately 2 acres could be used for berthing in 8-foot or deeper water and that part of the harbor basin with depths less than 8 feet could provide a berthing of about 0.6 acre for small craft with drafts less than 8 feet. The landward 0.4 acre of the entrance and turning basin would permit mooring in 8-foot depths when waves are not coming through the entry. (See exhibit 5, page A-5.) The harbor is designed for a capacity equaling that of the authorized project; therefore, the new plans do not conflict with the project document.

1.16 The breakwaters at both harbors would be placed to resist wave action and to provide safe entry for approach from the most protected direction. Although the proposed harbor basin for the Lutsen project deviates significantly from the entrance and inner channels authorized in the project document, the proposed harbor basin at Silver Bay is comparable to that authorized in the project document except for one basic difference. The harbor depth used in the project document is 12 feet, while the depth proposed for the alternate location is 8

feet. Likewise, the harbor basin at Silver Bay will be excavated to a depth varying from that authorized in the project document. An 8-foot depth has been used for many of the existing small-boat harbors on Lake Superior within this District and has been found satisfactory.

1.17 Harbor excavation at both Schroeder and Silver Bay is proposed to provide a harbor and mooring area with a minimum 8.0 foot water depth wherever possible. At Schroeder preliminary probings and observations of the geology of the area indicate that 2.0 feet to 2.5 feet of loose rock overburden exists over the solid rock. It is proposed to remove as much of the loose overburden as possible without necessitating solid rock removal. This would result in greater water depths than currently exist, but the 8.0-foot depth below LWD (600.0 IGLD 1955) would not be attained over the entire harbor excavation area. (See exhibit 4 for area to be excavated). The shoreline slope would be 1 vertical on 3 horizontal. At Silver Bay it was determined to excavate only a portion of the harbor to an 8-foot depth. This excavation involves removing solid rock which is very costly and difficult. A variable water depth will be created in the area where only the loose overburden will be removed. Minimum water depth in this area will be approximately 3 to 4 feet. (The areas of variable harbor depth, rock excavation and 8-foot harbor depth are outlined in exhibit 5). The shoreline will have a slope of 1 vertical on 3 horizontal. Detailed breakwater designs and further consideration of harbor depth will be analyzed as part of the final design plans. Submission date for Phase II GDM is shown on page 9.

1.18 Shore protection in the form of riprap and rubble rock is proposed for the harbor at Silver Bay to protect the shoreline from possible erosion resulting from wakes or waves inside the harbor area and to attenuate waves reaching the shoreline through the harbor opening.

ANCILLARY FACILITIES

1.19 The authorizing document provides for the following features: a safe entrance; a protected anchorage; mooring area or bulkheads adequate for accommodation of transient boats; and a channel along the frontage reserved for local boats of sufficient width to permit maneuvering in and out of stalls or slips. As authorized in the document, local interests are responsible for providing the public wharf or bulkhead, furnishing any areas required on shore for dredge material and furnishing the lands, rights-of-way and easements necessary for the proposed work. Most of the land to be acquired for the harbor-of-refuge at Shroeder is presently owned by 3 or 4 private interests. Reserve Mining owns the desired lands at Silver Bay. However, Reserve Mining has indicated a willingness to negotiate with the city of Silver Bay for public acquisition of the land. Parking and servicing areas are also usually provided by local interests. House Document No. 446 indicates a need for additional mooring, servicing and berthing facilities on the Great Lakes. Both proposed harbors are being designed for the eventual construction of minimal berthing facilities.

1.20 A boat access, a restroom, picnic and parking facilities, access road pavings, and additions to the wharf required by the project are being proposed for the proposed harbors-of-refuge at Schroeder and Silver Bay. Current Federal laws and Corps of Engineers policies provide authority and guidance for recreation development at water resource projects (see exhibit 16). The sponsoring cities of Silver Bay and Schroeder have expressed their willingness to participate in the proposed recreation developments as required. (See exhibit 17 for letters of intent from the cities of Silver Bay and Schroeder.) A recreation resources analysis has been completed for the Schroeder and Silver Bay sites; however, construction of the proposed recreational facilities is not currently authorized. Upon submittal of this document, the proposed recreation development at the subject harbor areas will be presented to the Chief of Engineers in a Post Authorization Change Letter. If the recreation proposals are accepted, the concepts will be represented and refined in future planning documents. See paragraphs 4.74, 4.75, 4.76 and 4.87 for additional discussion of specific impacts of recreational development.

OPERATION AND MAINTENANCE

1.21 The responsibility of the Corps of Engineers for both proposed harbors would be to maintain the harbor entries and to insure provision of navigational safeguards. The principal operation and maintenance activities attendant to this end involve breakwater repair, dredging, and dredge material disposal.

BREAKWATER MAINTENANCE

1.22 The principal Corps structures in the proposed harbors-of-refuge would be the breakwaters. The crane barge MARKUS (DKS-20) attended by the tug DULUTH and the tender FAIRCHILD (CLEVELAND), as well as the derrick barge COLEMAN attended by the tug LAKE SUPERIOR and the tender BAYFIELD, are the usual complement of equipment used to repair the north shore breakwaters. The MARKUS (DKS-20) and the COLEMAN can be used to transport repair equipment and supplies and can be equipped with a mechanical rock grapple for hoisting, moving and placing the 3- to 10-ton boulders at the repair site. Maintenance would consist primarily of replacing rock torn from the breakwaters during Lake Superior storms.

DREDGING

1.23 The Corps of Engineers dredging in the north shore harbors is usually performed by either the MARKUS (DKS-20) or the COLEMAN in conjunction with tugs, tenders, and bottom dump scows. Presently, initial dredging is expected to remove 13,637 cubic yards of material from the proposed harbor basin at Silver Bay and 2,890 cubic yards of material is estimated to be excavated from the proposed harbor basin at Schroeder. Excavation at Silver Bay would include blasting of solid rock. Little or no maintenance dredging is anticipated for either harbor project due to both the "pocket" nature of the harbors, resulting in no significant amount of fluvial sediment deposition, and the rocky nature of the harbor bottoms and shorelines. Because of the prevalent rocky

bottoms in the two harbor areas, there should be no substantial sedimentation due to wave action and littoral currents. Supporting this statement is the fact that very little material was excavated in the construction of the Reserve Mining Harbor in Silver Bay and the dredged material was rock. To date, Reserve Mining has done no maintenance dredging.

DREDGE MATERIAL DISPOSAL

1.24 Sediment analysis of the proposed site at Schroeder showed moderate to high levels of arsenic, copper, and nickel. Using the (limited) available data, the U.S. Environmental Protection Agency (EPA) classified the sediments as polluted and unsuitable for open lake disposal. Most recent analyses of the sediment samples taken from the proposed project site at Silver Bay show moderate levels of copper and nickel, and no apparent PCB and pesticides pollution. As of this date, the EPA has not classified the Silver Bay harbor as to its pollutional status.

1.25 On-land disposal and limited utilization of large, dredged boulders as riprap along the harbor shoreline at Silver Bay is the disposal method proposed. Final plans for the disposal of the dredge material have been coordinated with Federal and State agencies (see exhibit 26).

1.26 The disposal site for Silver Bay is an approximately 1.3-acre area west of the harbor. (See exhibit 5.) The site is a disturbed area devoid of vegetation or dominated by weedy and/or early pioneer plant species. The site has been used as a borrow site by the Reserve Mining Company for construction materials for their west breakwater. The access road and maneuvering area for this site have previously been filled with rock debris. The borrow area is now a topographic depression where leaching and erosion of dredge material should not be a problem.

1.27 The volume of material to be dredged from the Silver Bay harbor project is about 15,000 yd³. This volume placed on the disposal area would cover the site an average of about 7 feet deep. Landscaping to conform with the topography of the area would alter the 7-foot figure (depression areas would get more fill, higher areas less).

1.28 The disposal site for Schroeder is a large site, about 40 acres. It is about 3 miles north of the harbor on an access road to a rock quarry. (See exhibit 4.) The site has been recently cleared of birch trees. The soil is gravelly.

1.29 The volume of material to be dredged from the Schroeder harbor project is about 3,000 yd³. This volume placed on the disposal area would cover the site an average of less than 0.05 feet deep. Most likely the dredge material would be selectively placed on only a fraction of the disposal site to conform with the topography of the area. If there is the potential for groundwater intrusion, a sealer or lining will be used at the site.

1.30 The topographic setting of this site (taken from a USGS quadrangle) is:

- distance from lake - 1 mile
- elevation above lake - 300 feet
- local relief of general area is moderate to steep slope down to lake
- relief of disposal area
 - Entire area is fairly flat with less than 10 feet elevation difference.
 - The disposal area is bounded on the lakeward side by a small ridge or knoll, which would prevent dredge material from being eroded into the lake.
 - Placement as close to the road as possible would help prevent movement of dredge material.

ECONOMICS

1.31 According to October 1975 price levels, the estimated Federal first cost of the Silver Bay (Beaver Bay) project is \$2,580,000 with the possibility of up to an additional \$56,000 for recreation, with a Federal annual maintenance cost of \$10,600; the Federal first cost of the Schroeder (Lutsen) project is currently estimated at \$4,043,000 with the possibility of up to an additional \$40,000 for recreation, with a Federal annual maintenance cost of \$16,600. Exhibits b-9, pages A-6 through A-9, summarize the total first cost estimates and average annual charges of the proposed Silver Bay and Schroeder projects. Those estimates are based on Phase I studies and on October 1975 price levels. The interest rate of 3 1/4 percent was used for computing Federal and non-Federal annual charges. This is according to the Water Resources Council Regulations on discount rates which provided that a rate of 3 1/4 percent would apply to those projects where appropriate non-Federal agencies had given by 31 December 1969 "satisfactory assurance to pay the required non-Federal share of project costs." Amortization is assumed for a 50-year project life.

1.32 Small employment and economic impacts would be expected if the proposed action is implemented. While some unskilled labor would be drawn from the local labor force, the skilled laborers would be employees of the contractor. There would be an indirect economic gain from expenditures during construction and further operation and maintenance procedures. A foregoing of tax base on affected land areas would likely occur.

1.33 The project document stated that the number of small craft, including commercial fishing vessels but excluding boats propelled by outboard motors, registered and documented on Lake Superior as of 1 January 1940, was 450 recreational and 443 commercial fishing type. The Great Lakes Basin Framework Study, Appendix 9, Volume 2, "Recreational Boating," indicates that in 1970 commercial fishing and recreational craft in the Wisconsin and Minnesota harbors on Lake Superior totaled 1,850, 1,280 craft berthed along the north shore alone. This is more than double the number of craft on the entire lake in 1940, when the Lutsen and Beaver Bay Harbors were recommended for construction.

1.34 Information from Drill's Marina at Duluth, Minnesota, indicates the usual type of boats to be found along the North Shore are powerboats, 25 to 40 feet long, trailer-drawn boats 20 to 23 feet long, and sailboats of all sizes. Many of the powerboats have FM radios and direction finders. Some of the trailer-launched craft have FM or citizen band radios. Even though top speed for many of the craft is about 30 miles per hour on relatively calm water, maximum speed with rough water is closer to 10 miles per hour, and slower as the storm increases. Due to the suddenness of spring and summer squalls, boaters may find themselves many hours from any safe refuge.

1.35 At present there are five existing harbors along the North Shore functioning as harbors-of-refuge. These include four Federal harbors located at Duluth, Knife River, Two Harbors, and Grand Marais; and a non-Federal harbor located at Grand Portage. Two deep-draft private harbors, Taconite Harbor and Reserve Mining's Silver Bay harbor, also provide some refuge for small craft from unexpected storms. However, small craft avoid these large commercial harbors whenever possible because of the roughness of the large, exposed outer harbors, the potential dangers attendant upon the movement of large vessels, the absence of suitable moorings, and the likelihood of encountering oily and fouled water. To our knowledge, harbors other than the above-mentioned are very limited. King's Landing, a few miles from Silver Bay, functions primarily as a launching area and in the event of a storm would be capable of handling only a few boats at best. Just north of Lutsen, there is an anchorage area utilized by local fishermen. However, this area does not provide safe refuge from a storm. The North Shore does not offer much in the way of natural bays or coves which could provide shelter should the need arise.

CONSTRUCTION SCHEDULE

1.36 Phase I studies, restudies to determine if the authorized projects meet current needs and planning objectives, have been completed for the two proposed harbors. The current proposed schedule is as follows:

	<u>Completion of phase II</u>	<u>Plans and specifications</u>	<u>Award 1st contract</u>
Beaver Bay (Silver Bay)	February 1978	June 1978	March 1979
Lutsen (Schroeder)	March 1978	July 1978	March 1979

Construction is anticipated to start between April 1979 and September 1980.

2. ENVIRONMENTAL SETTING WITHOUT THE PROPOSED PROJECTS

GEOGRAPHIC SETTING

2.01 The areas adjacent to the proposed harbors-of-refuge at Schroeder and Silver Bay are typical of the north shore of Lake Superior. They are characterized by rocky land-water interfaces with isolated beaches and second growth stands of aspen, birch, spruce, fir and cedar.

PHYSICAL ENVIRONMENT

CLIMATE

2.02 Schroeder and Silver Bay are subject to the continental-type climate characteristic of Minnesota with frequent outbreaks of continental polar air coming down from Canada throughout most of the year. Lake Superior exerts a strong microclimatic influence on the immediate shoreline, generally resulting in cooler summer temperatures and warmer winter temperatures than those experienced a few miles inland. Storms which have their origin in northwestern U.S. and some which originate in the southwestern part of the U.S. generally migrate northeastward through the area and are followed by cooler polar air masses from the north. As Schroeder and Silver Bay have no weather reporting stations, the following statistics were taken from Grand Marais and Two Harbors, the two closest reporting stations. Two Harbors is located 29 miles southwest of Silver Bay while Grand Marais is located 30 miles northeast of Schroeder. Thus with careful consideration, a certain amount of extrapolation of data can be accomplished.

2.03 Summers are pleasant with a mean temperature of 62.1°F. in Two Harbors and a mean temperature of 58.1°F. in Grand Marais. During the month of August, Two Harbors reports a mean daily maximum temperature of 75.4°F. and a mean daily minimum of 54.2°F. while Grand Marais reports a mean daily maximum of 70.7°F. and a mean daily minimum of 52.6°F. Winters are cold with outbreaks of cold Canadian air which frequently drop the temperature below the zero mark. The mean winter temperature in Two Harbors is 17.1°F., with a mean daily maximum temperature of 23.1°F. and a mean daily minimum temperature of 3.5°F. in January. Grand Marais has a mean winter temperature of 16.9°F. with a mean daily minimum temperature of 4.8°F. in January. Extreme temperature variations recorded at Two Harbors were a high of 99°F. and a low of -36°F. Grand Marais recorded a high of 100°F. and a low of -34°F. for its extreme temperature variations.

2.04 Average annual precipitation is 27.45 inches in Two Harbors and 25.46 inches in Grand Marais with most of the precipitation occurring between May and September in the form of rain. The highest mean precipitation for Two Harbors occurs in June with 3.95 inches; Grand Marais records its highest mean precipitation during the month of September at 3.25 inches. Annual snowfall averages about 55 inches at Two Harbors and between 60 to 70 inches at Grand Marais. The first snowfall usually occurs in October and the last in April. The average number of frost-free days in a year is 140 days for both Two Harbors and Grand Marais. The first frost usually occurs in early October and the last frost in middle May.

2.05 Prevailing winds in Two Harbors are out of the northeast while the prevailing winds in Grand Marais are from the northwest and northeast. Wind velocity exceeds 30 mph on an average of 30 days of the 5-month (May to September) small-craft boating season. Storms accompanied by high wind, particularly out of the northeast for Two Harbors and out of the northeast or southwest for Grand Marais, blow up quickly and are characteristic of the spring and fall seasons. During heavy gales, 12-foot waves are common, and gale force winds have generated lake waves as high as 16 feet. Shipboard observations have recorded waves as high as 23 feet. During the summer months, dangerous squalls may occur at any time and frequently very suddenly. The lake is subject to fog throughout the year. Volume 2, "Recreational Boating," to Appendix 9 of the Great Lakes Basin Framework Study states that during the 1968 season small-craft warnings were issued for all or a portion of 24 days each month and fog occurred 28 days in the Minnesota and Wisconsin portions of Lake Superior.

TOPOGRAPHY, GEOLOGY AND SOILS

2.06 The present-day shoreline of Lake Superior was shaped largely during the Great Ice Age, which extended from a few hundred thousand years ago to several thousand years ago. During this period several ice sheets advanced and retreated over the area filling valleys, gouging out lakes, and forming ridges and hills. Each advance of the ice buried and destroyed many of the older land forms; the appearance of the present landscape is due largely to the effects of the last advance, the Wisconsin glaciation, and to post-glacial events.

2.07 The most prominent geologic feature of the north shore of Lake Superior from Duluth to the International Boundary is a strip of basalt ranging from 15 to 20 miles wide from the Lake Superior shore inland. This strip of basalt is covered by an irregular mantle of red glacial drift which is interspersed with rock outcroppings. The geology of the immediate project areas consists of basalt bedrock covered with a thin layer of glacial drift. The lake bottom in the proposed project areas is a heterogeneous mixture of bare ledges, rocks, boulders and gravels of different gradation.

2.08 Known mineral resources of the two harbor areas are limited to sand, gravel, and stone. Nickel and other metals bound in sulfides may occur in the area in uneconomic concentrations.

2.09 The Minnesota shoreline along Lake Superior consists of very rugged rock outcroppings all the way from Duluth to the Canadian border. The shore is relatively straight, although in detail it is interrupted by points and shallow bays. Many short streams 10 to 15 miles long lead from the land area to the lake with most of them having falls at the lower reaches. The land rises quite rapidly reaching heights of 900 to 1500 feet above mean sea level within several miles of the shoreline.

2.10 The topography near the proposed harbor of refuge site at Schroeder is rolling with moderate grades, 8 to 10 percent. Land elevations rise from the waters edge elevation of 602.0 \pm feet USGS (1929 adj) to elevations of 700.0 \pm feet USGS (1929 adj) on U.S. T.H. 61. Vertical drops occur along a section of shoreline which will form the northern part of the harbor. Vertical drops also occur at the mouth and along the edges of the Cross River where the continuous flow of water has eroded into the underlying rocks. The remainder of the area has a uniform slope rising from the lake shore to U.S. T.H. 61. These features are illustrated with contours in exhibit 4. The Schroeder area has been disturbed in the past. The Schroeder Lumber Company operated a sawmill at the mouth of the Cross River around the turn of the century. Evidence of bank shoring can still be seen along the steep banks of the river and iron mooring rings remain submerged at the mouth of the river.

2.11 The topography near the proposed harbor-of-refuge at Silver Bay is rugged with several small bays or inlets near the proposed construction site. Land elevations rise rapidly from the waters edge - elevation 602.0 \pm feet U.S.G.S. (1929 adjustment) to elevation 714.0 \pm feet U.S.G.S. (1929 adjustment), approximately 500 feet landward. These features are illustrated in exhibit 5. The Silver Bay site has been badly disturbed in two areas by blasting and bulldozing. The future parking and boat storage site has been used as a borrow site by the Reserve Mining Company for material for construction of their west breakwater. The access and maneuvering area to this site has been filled with a sort of rock debris.

2.12 The northeastern part of Minnesota is underlain by Upper Precambrian rocks, which are generally designated as Keweenaw lavas. The volcanic rocks of this area have been named the North Shore Volcanic Group. In the Schroeder area, the rocks on and near the harbor of refuge are known as Schroeder basalts.

2.13 In the Beaver Bay - Silver Bay area several intrusions into the volcanic rocks occur. These intrusions have been called the Beaver Bay Complex. Geologic mapping of bedrock in the area of the proposed harbor-of-refuge indicate that volcanic rocks, Beaver Bay ferrogabbro, Black Bay gabbro, and gabbroic rocks exist adjacent to and on the proposed site.

2.14 Surface deposits at Schroeder are best described as a red granular drift. These layers are very thin as evidenced by numerous outcroppings and exposed rock.

2.15 At Silver Bay surface deposits are described as the Superior and Rainy lobe drifts; these deposits are very shallow as evidenced by numerous exposed rock. The soil texture varies from fine grained clays and silts to granular sands and gravels.

2.16 Generally speaking, soils in the region tend to be shallow, coarse, stoney and acidic in nature and are characterized as arising mainly from Ontonagon Group outcrop and weathered glacial debris. Neither the soils nor the sloping topography are particularly conducive to agriculture.

2.17 A probing program was set up at both sites to determine the depth of loose overburden in the areas where material must be removed from the lake bottom for harbor construction. At Schroeder the probings reveal a shallow granular overburden along the shoreline varying from 2.0 feet to 2.7 feet in thickness. The surface under the water could not be penetrated, but it was observed that the lake bottom is covered with random boulders. It was assumed that the loose rock and boulder layer was also approximately 2.5 feet thick.

2.18 The results at Silver Bay revealed the texture of the loose overburden or drift to vary from fine silt and clay to large boulders. The depth varied from 2.7 feet to 3.3 feet. A scuba diver observed the bottom conditions along the center line of the proposed breakwater. It was found that the bottom conditions at the breakwater alignment consist of well-rounded boulders of varying size, randomly placed, creating a relatively flat surface. The spaces between the large rocks, 3.0 ± feet in diameter, are filled with smaller rocks, 6 inches or less in diameter. A probing rod was unable to penetrate the loose rock layer at the breakwater alignment. It was therefore assumed that the loose overburden layer extends across the harbor site at the same depth, around 3 feet, found near the shoreline.

AQUATIC ENVIRONMENT

SURFACE WATER

2.19 Both proposed sites are located in the Lake Superior Watershed Unit as described by the Minnesota Department of Natural Resources. All waters within the watershed unit flow into Lake Superior, through the Great Lakes and the St. Lawrence River, and eventually into the Atlantic Ocean. Most of the streams in the area are relatively short and have steep gradients. The only major streams in the immediate vicinity of the proposed harbor site at Silver Bay are the Beaver River, flowing into Lake Superior 4 miles southwest of the site, and the Baptism River, the mouth of which is located 5 miles northeast of the site. The nearest major streams to the site at Schroeder are the Temperance River and Carlton Creek, flowing into Lake Superior at respective distances of 1 mile and 4 miles northeast of the harbor site, the Two Islands River dumping into Lake Superior approximately 2 miles southwest of the site, and the Cross River located immediately west of the harbor site.

GROUNDWATER

2.20 The thin covering of glacial drift (0 through 40-foot thickness) and the complexity and imperviousness of the bedrock are responsible for the lack of abundant groundwater in the area. The basaltic lava is an unpredictable aquifer; private wells have revealed a variety of subsurface conditions and a great variation in the yield and character of the generally hard groundwater. There is no specific information currently available for the areas of the proposed projects.

WATER QUALITY

2.21 The eutrophication process in Lake Superior is apparently progressing at an extremely slow rate as dictated by nature, with little alteration by the activity of man. Therefore, the measured changes in water quality are misleading when viewed from the eutrophication standpoint alone. The effect of the activity of man on Lake Superior could be more readily seen in the examination of other chemical and physical parameters.

2.22 The introduction of halogenated hydrocarbons is recent and a function of the activities of man. At present there is virtually no information on the levels of these compounds in Lake Superior. Measurement of these parameters is important because of the deleterious effects of the parent or breakdown products. The presence of heavy metals, taconite tailing dumping, and asbestos-like materials are acknowledged although their effects are still largely undetermined.

2.23 Lake Superior, the dominant body of surface water in the area, is characterized by soft water. Hardness is approximately 44 ppm CaCO_3 . The pH is approximately 7.5. Water temperatures in Lake Superior fluctuate slightly, ranging in the 40's most of the year.

2.24 Shipping has been responsible for some water quality degradation in the open waters and harbor areas of Lake Superior. Oil discharges, bilge wastes and garbage from commercial vessels plying the lake have created occasional problems. However, enforcement programs have become more stringent in recent years, and the problem is not yet considered acute.

2.25 The water quality generalizations made for the open lake are appropriate for most of the inshore waters. The widespread indications of change and deterioration observable in the inshore waters of the other Great Lakes are, for the most part, not apparent in Lake Superior. There are exceptions, however. These include water quality problems in the Duluth-Superior Harbor and at Silver Bay on Minnesota's north shore. Pollution loads released by paper and steel mills, and other industrial and municipal wastes dumped into the St. Louis River and Superior Bay, have created problems in the Duluth-Superior area.

HARBOR WATER QUALITY

2.26 Five sediment samples from the proposed harbor-of-refuge site at Silver Bay were taken by Corps personnel in October 1975. These samples were analyzed by SERCO⁽¹⁾ in January 1976 with results showing high PCB values for two of the sediment samples. (See exhibits 18 and 19 for sample location data.) Bulk sediment analysis, conducted by the EPA in February 1977, showed low levels of organics and nutrients, moderate levels of copper and nickel (all other metals analyzed were low), and the absence of apparent PCB and pesticides pollution. Because of the conflicting results and a lack of taconite tailings data, the EPA did not make a final classification.

2.27 The EPA bulk chemistry analysis results from samples from the Schroeder site show low levels of all parameters measured except for the metals arsenic, copper, and nickel. The levels of these three metals are in the moderate to high range. Arsenic is particularly elevated. In view of the above findings and limited available data, the EPA has classified the sediments as polluted and unfit for open-lake disposal.

2.28 The EPA bulk chemistry analysis results from samples from the Schroeder site show low levels of all parameters measured except for the metals arsenic, copper, and nickel. The levels of these three metals are in the moderate to high range. Arsenic is particularly elevated. The harbor at the Schroeder site is mostly solid bedrock and large boulder. The samples were taken from outside the area to be dredged. Borings of the area to be dredged revealed only small amounts of sand and gravel. Fines were found almost exclusively outside the area to be dredged. Trace metals such as arsenic, copper, and nickel have their highest concentrations in clay-sized fractions of sediments. The potential for adverse environment of effects from metals in the fine sediments. The potential for adverse environmental effects from metals in the fine sediments depends partially on the amount of this sediment in the dredge material. The dredge material to be removed from the Schroeder site consists almost exclusively of large sized boulders and fragments of bedrock. The adverse environmental effects of trace metal contamination on water quality are negligible.

2.29 The proposed harbors at both sites would be "pocket harbors." That is, neither harbor has a river or stream flowing through it, which would carry and deposit sediment loads. Consequently, the major influence on water quality in these harbors would be the movement of recreational craft, the limited natural watersheds of the harbors and the wave and storm action of Lake Superior. Lake Superior's influence would be primarily in providing movements of water into and out of the harbors. The natural watershed could be expected to exert some influence on the water quality at the Silver Bay site as there is evidence of some erosion on the shoreline from on-land water runoff.

(1) Sanitary Engineering Laboratories, Roseville, Minnesota

2.30 An additional factor may influence the harbor water quality at Silver Bay site, since the site would be adjacent to the southerly breakwater of the Reserve Mining commercial harbor and would thus be subjected to the pollution attributed to the daily dumping into Lake Superior of 67,000 tons of taconite tailings by the Reserve Mining Company. Reserve Mining will be totally using on-land disposal by 15 April 1980, in compliance with a U.S. District Court order.

2.31 Because of the proximity of Reserve Mining to the Silver Bay harbor-of-refuge, the summary points and conclusions to the 1972 series of studies done on the taconite tailings have been included in this impact statement since these tailings may have a bearing on the water quality of the proposed harbor. The following summary points were taken from a report prepared in May 1973 by the U.S. Environmental Protection Agency in response to a Court Order.

Summary Points

1. Cummingtonite is an accurate tracer for measuring tailing in Lake Superior. It is not found in tributaries except where there has been contamination from use of tailings, for ice control on highways, for example.
2. Tailings are deposited on the bottom over most of the western part of Lake Superior.
3. Tailings are a major component of the suspended solids of the western part of the lake.
4. Tailings are a major factor causing green water at least along the Minnesota shore.
5. Tailings reduce water clarity 25 percent or more over an area of at least 600 square miles.
6. Tailings have been found as a major component of the suspended solids in the city of Duluth and National Water Quality Laboratory intakes in every sample that has been analyzed during 1972-1973.
7. In 500 days, tailings dissolved approximately twice as fast as a natural lake sediment and to the extent of .3 to 1.0 percent.
8. Calcium, magnesium, sodium, alkalinity, manganese and silica are major constituents comprising the soluble portion.
9. The discharge contributes at least 160,000 pounds per day of dissolved solids to the Lake water, not including contribution from suspended tailings, tailings on the Lake bottom, and those in contact with the interstitial water.

10. A 100 square mile test area of the lake having high tailings deposition contained higher potassium and manganese concentrations compared to a similar area of low tailings deposition concentrations. The interstitial water had higher silica, magnesium, copper, calcium and manganese, but lower organic carbon and hydrogen and reactive phosphate concentrations.

11. The discharge usually has higher counts of bacteria than the intake, but coliforms counts are relatively low.

12. Bacteria associated with the tailings are stimulated to grow or survive longer in lake water with tailings present.

13. Tailings as low as 4 ppm have a mild stimulatory effect on phytoplankton growth under some conditions. The manganese content of tailings may be an important contributing factor.

14. Results from incomplete experiments suggest tailings may have a strong stimulatory effect on algal periphyton.

15. Pontoporeia, an important food species of lake trout and herring, limited to a few lakes in the U.S., are reduced in numbers over an area at least some 30 through 40 miles southwest of the plant. There is an increase in midges and oligochaetes.

16. This reduction in Pontoporeia is reflected in altered food habits of a fish, the sculpin, living in the area of reduced Pontoporeia populations.

17. Tailings do not appear to be directly toxic to most organisms.

18. Changes in organism populations would have to approach 50 percent before they would be detected in the Lake.

19. Tailings are chemically and biologically active.

Conclusions of Summary Points

The 1972 studies supplemented and increased confidence in the effects identified in earlier studies. The distribution and persistence of tailings in the Lake is greater than previously shown. Chemical, physical, and biological effects have been demonstrated in the lake, and tailings as the cause have been im-

plicated by controlled laboratory tests. The changes measured in the Lake were difficult to demonstrate, partly because large changes are needed to be clearly measurable, and fortunately changes do not appear to be that large, as yet.

In summary, the effects of the Reserve Mining Company discharge are in the direction of degradation, mostly because the materials being added are persistent and the flushing rate of the lake is very slow. These effects are, for the most part, irreversible and cumulative.

2.32 Also of possible concern is the recent discovery of asbestiform fibers in the Lake Superior waters, the origin of which is claimed to be the taconite tailings. The extent of the potential hazard and the feasibility of possible solutions are currently being reevaluated. On 14 March 1975, the Circuit Court of Appeals in St. Louis, Missouri, found that evidence exists which indicates that Reserve's discharge into Lake Superior may constitute a health hazard, but that evidence is inadequate to show an immediate danger to public health exists. The circuit court, therefore, found that Reserve Mining must be given a reasonable period of time within which to change its operation to on-land disposal of taconite tailings.

2.33 While the Minnesota Pollution Control Agency (MPCA) is conducting a continuous water analysis on the Silver Bay commercial harbor, they have not, nor has any other agency, done any studies on bottom sediment samples. Though the EPA has done water analysis studies on the Silver Bay harbor, the data are not currently available because of the litigation over taconite tailings disposal. The EPA has not as yet classified the commercial harbor as "polluted" or "non-polluted."

BIOLOGICAL ENVIRONMENT

GENERAL

2.34 The forests of the Silver Bay and Schroeder areas are both coniferous and deciduous. Originally the region had magnificent stands of red and white pine, but intensive logging and fires changed the character of the forest dramatically. Today, the landscape is characterized largely by second-growth stands of aspen and birch, jack and red pine, and some balsam fir, spruce and tamarack.

2.35 The shoreline of Lake Superior is a composite of beaches, boggy areas, and upland forests. These areas provide habitat for a variety of fish and wildlife species. The aquatic environment and adjacent lands provide food and shelter for more than 100 species of waterfowl, shorebirds, songbirds, upland gamebirds, and birds of prey.

TERRESTRIAL VEGETATION

2.36 Jack pine is the predominant pine, but white and red pine are frequently found, often mixed with white spruce and balsam fir. In exposed areas the common juniper is found. White cedar and sometimes ground hemlock are observed in lowlands and on rocky points and islands. Black spruce and tamarack are dominant in bogs.

2.37 Deciduous trees are often mixed with the conifers. Aspen, paper birch, red and mountain maples, and mountain ash are frequently encountered. Along waterways, ash, yellow birch, and American elm may be found. In wetlands and shore areas, balsam poplar, willow, dogwood, and alder are common. Successional stages following forest disturbance are often dominated by trembling and large-toothed aspen. The heart-shaped birch is often seen along the shore of Lake Superior. Ninebark, thimbleberry and juneberry are among the common shrubs.

2.38 Herbaceous vegetation of the north shore includes such plants as false lily-of-the-valley, wild sarsaparilla, big-leaved aster, Clinton's lily, goldthread, bunchberry, shieldfern, bedstraw, shin-leaf, dwarf raspberry, twisted stalk, starflower, and twin flower. In addition there are many species of sedges, grasses, composites, ericads, violets, clubmosses, ferns, orchids and lilies that comprise a significant part of the flora.

2.39 In rocky crevices along the shore and in river gorge walls there are a variety of sedges, rushes, grasses, mosses, lichens, ferns and forbs. Aquatic and emergent plants include yellow pond lily, various species of pondweed, water plantain, cattail, bulrush, arrowhead, bur-reed, manna grass, spike rush, and wild calla.

2.40 Sphagnum bogs often include leather-leaf, bluejoint grass, manna grass, willow, sedges, marsh cinquefoil, sweet gale, wool or cotton grass, spiraea, wild calla, cranberry, pitcher plant, sundew, Labrador tea, blueberry, laurel and some orchids. The Silver Bay site is heavily vegetated down to the shoreline while the Schroeder site has open land with some birch trees, shrubs and grasses. The land becomes more heavily vegetated as it extends inland and includes a stand of spruce.

2.41 Coordination with appropriate State and Federal agencies has not revealed any threatened or endangered flora present in the project areas. The latest Federal Register has also been reviewed and no plant species were identified as present in the area which were threatened or endangered.

WILDLIFE

2.42 The wildlife resources in the area provide many hunters, photographers, and wildlife observers with recreation. A wide variety of game is available, most importantly the whitetail deer. The Lutsen area is particularly noted for its high winter concentration of deer. As winter approaches, the deer population near the north shore tends to congregate within about a mile of the Lake Superior Shoreline. Heavy concentrations are found along a 4-mile strip from the Onion River to the Cascade River.

2.43 Among the approximately 50 species of mammals found in the area are black bears, foxes, skunks, porcupines, squirrels, mice, weasels, beaver, and snowshoe hare. The moose and the endangered timber wolf are infrequently found along the Minnesota shore. Also found are rare or uncommon mustelids such as the pine marten and fisher.

2.44 The area's virgin forests of presettlement times supported small numbers of the game species presently hunted, in comparison to present numbers. Drastic changes followed settlement. Logging operations resulted in numerous openings in the forest canopy and increased supply of food and habitat for many forms of wildlife. Populations of others, such as the caribou, decreased. Currently, natural forest succession is decreasing the quality of the habitat for the most often hunted upland game species.

2.45 Amphibians and reptiles are not abundant in the region, but there are perhaps a dozen species.

2.46 Many species of warblers nest along the North Shore, including the parula, chestnut-sided, Blackburnian, black-and-white, black-throated green, Canada, myrtle, and mourning warblers. Also found are the chipping, song and white-throated sparrows and the pine siskin. Many species of hawks and owls, as well as the bald eagle make the North Shore of Lake Superior their home. In the fall, the North Shore is one of the most heavily travelled hawk migration routes in the United States. Ruffed grouse are the prominent upland gamebirds of the area.

2.47 Waterfowl in the area consist primarily of diving ducks. Greater scaup, lesser scaup, ringnecks, American goldeneyes, and American and redbreasted merganser are found. Diving ducks occasionally raft up or winter on Lake Superior. These may include the bufflehead and old squaw. Occasionally, other diving ducks concentrate in Lake Superior's bays and some larger lakes in the area.

2.48 In addition to the diving ducks, puddle ducks, or dabblers, use the area's rivers, lakes, and marshes during their breeding and migration seasons. These species include mallards, black ducks, and wood ducks.

2.49 Several species of geese migrate through the area, and some Canada geese may nest in Lake County. Loons, Minnesota's State birds, are common to most of the area. Their beauty and eerie cry add substantially to the wilderness appeal of this area.

2.50 Probably the most conspicuous species of bird around the Silver Bay site is the herring gull. Small islands located just offshore serve as rookeries for the birds and offer isolated breeding grounds to rear the young. The birds utilize the existing breakwater and rock outcrops extensively for perching.

FISH

2.51 A variety of fish species are found in the near shore or harbor areas of Lake Superior. The assemblage of fish is generally comprised of stenothermal "cold water" species (whitefish, trout, etc.), but species are also present which are typically found in warmer water (walleye, yellow perch and northern pike). The following table lists common species found in near shore waters in harbors of Lake Superior.

2.52 The following list of the species is not specific to the project areas, but rather an information base which encompasses the western end of Lake Superior. Not all species are found in the same area or harbor zone.

List of common fish species found either in nearshore, or harbor areas of Lake Superior

Common name	Scientific name
Lake Herring	<u>Coregonus artedii</u>
Lake Whitefish	<u>C. clupeaformis</u>
Ciscos (3 species)	<u>C. nigripinnis</u>
	<u>C. zenithicus</u>
	<u>C. reighardi</u>
Round Whitefish	<u>Prosopium cylindraceum</u>
Pygmy Whitefish	<u>P. coulteri</u>
Lake Trout	<u>Salvelinus namaycush</u>
Brook Trout	<u>S. fontinalis</u>
Rainbow Trout	<u>Salmo gairdneri</u>
Brown Trout	<u>S. trutta</u>
Coho Salmon	<u>Oncorhynchus kisutch</u>
American Smelt	<u>Osmerus mordax</u>
Longnose Sucker	<u>Catostomus catostomus</u>
White Sucker	<u>C. commersoni</u>
Red Horse	<u>Moxostoma sp.</u>
Mottled Sculpin	<u>Cottus bairdi</u>
Slimy Sculpin	<u>C. cognatus</u>
Spoonhead Sculpin	<u>C. ricei</u>
Fourhorn Sculpin	<u>Myoxocephalus quadricornis</u>
Trout Perch	<u>Percopsis omiscomaycus</u>
Burbot	<u>Lota lota</u>
Alewife (rare)	<u>Alosa pseudoharengus</u>
Walleye	<u>Stizostedion v. vitreum</u>
Yellow Perch	<u>Perca flavescens</u>
Johnny Darter	<u>Etheostoma nigrum</u>
Lake Chub	<u>Hybosis plumba</u>
Spottail Shiner	<u>Notropis hudsonius</u>
Emerald Shiner	<u>N. athenoides</u>
Nine Spine Stickleback	<u>Pungitus pungitus</u>
Common Stickleback	<u>Eucalia inconstans</u>
Northern Pike	<u>Esox lucius</u>
Smallmouth Bass (rare)	<u>Micropterus dolomieu</u>
Largemouth Bass (rare)	<u>M. salmoides</u>
Eel (rare)	<u>Anguilla rostrata</u>
Carp (rare)	<u>Cyprinus carpio</u>
Lamprey	<u>Petromyzon marinus</u>
Brown Bullhead (harbors)	<u>Ictalurus nebulosus</u>
Black Bullhead	<u>I. nebulosus</u>

2.53 Lake Superior is characterized by salmonids including lake trout, steelhead, and brown trout and, more recently, the coho and chinook salmon. The lake trout has been gradually depleted over the years by the lamprey and heavy fishing pressure, but overall it has been and continues to be the most important sport fish caught in Lake Superior. Present populations are higher than those of the recent past. Lake-run brown trout and rainbows are important and receive heavy fishing pressure during the early spring.

PLANKTON

2.54 The plankton population of Lake Superior is sparse and dominated by forms characteristic of cold, deep lakes. Recent studies show that diatoms are the most abundant plankton groups.

2.55 The most abundant forms of phytoplankton include: Asterionella formosa, Dinobryon sp., Synedra acus, Cyclotella sp., Tabellaria fenestrata, and Melosira granulata.

2.56 The following zooplankton have been listed as common in Lake Superior:

rotifers - Keratella cochlearis and Keblicottia longispina
cladocerans - Daphnia longispina and Bosmina longirostris
copepods - Diaptomus minutus, D. silcilis, Epischura lacustris,
Limnocalanus macrurus and Cyclops bicuspidatus

BENTHOS

2.57 The amphipod Pontoporeia affinis, opossum shrimp Mysis relicta, and the midge-fly genus Hydrobaenus are listed as the dominant members of the Lake Superior bottom fauna.

ENDANGERED SPECIES

2.58 The eastern timber wolf (Canis lupus lycaon) is the only endangered species identified as being present in the area. However, in October of 1974, the Minnesota Department of Natural Resources (MDNR) sent a petition to the Federal Department of the Interior to "delist" the wolf from an "endangered" status to the "threatened" status. The request was published in the Federal Register in November 1974. The MDNR generally anticipates their request will be granted. Individual animals or packs could be expected to wander through the immediate project areas although the territory of the pack would encompass a much larger area, perhaps a few tens of square miles. A proposal to classify the status of the bald eagle (Haliaeetus leucocephalus) as "threatened" was recently noted in the Federal Register (12 July 1976). This species is identified as present in the area on limited occasions. It is not expected that the proposed project would affect this species.

2.59 The most recent Federal Registers have been reviewed and no other endangered species have been identified as present in the proposed harbor areas. The Minnesota Department of Natural Resources and the U.S. Fish and Wildlife Service (see letters of comment) have not indicated any concern over threatened or endangered species present in the area. The U.S. Forest Service pointed out the presence of the timber wolf (see page 63) which is discussed above.

NATURAL AREAS

2.60 Much of Lake and Cook Counties are National and State forests. Of the 1.3 million acres comprising Lake County, 81 percent is commercial forest, of which 75 percent is publicly owned. Of the 879,000 acres of Cook County, only 2.7 percent is classified as non-forested land. Eighty percent of the land is classified as commercial forest land and of this, 65 percent consists of public land in the Superior National Forest. Much of the remainder is also under public administration. The forested acreage combined with the numerous lakes, streams, and cascades make the area an important resource for outdoor recreation of all kinds.

SOCIOECONOMIC ENVIRONMENT

ARCHAEOLOGICAL AND HISTORICAL

2.61 In compliance with Section 106 of the National Historic Preservation Act of 1966 and Executive Order 11593, the National Register of Historic Places has been consulted and as of 20 December 1977, the following sites in the general project area have been designated as important historical and/or cultural sites and marked for preservation where they might be endangered. These are: the Split Rock Lighthouse (Cook County), Father Baraga's Cross (Cook County), and Grand Portage National Monument (Cook County). Both counties contain a minimal number of known prehistoric sites, and most of these are located in the northern portion of each county, along the boundary waters region. This lack of information reflects a lack of investigations, not a known absence of cultural activities. At present, archaeological surveys of Superior National Forest and the Boundary Waters Canoe Area are being planned and conducted. Both projects will undoubtedly enlarge the number of known sites and increase our understanding of the course of prehistoric life in Northeastern Minnesota.

2.62 With such limited information it was impossible to adequately describe the existing cultural environment of the project areas. Therefore, a contractor was engaged to conduct a cultural resources investigation of the project areas. The following information is based on the final report of that study.

BEAVER BAY (SILVER BAY)

2.63 There are some indications that the vicinity of Beaver Bay and Silver Bay was an area of prehistoric and historic occupation by American Indians. Distinctive prehistoric artifacts (including some made of native copper) have been recovered from an island off Beaver Bay and from the mainland inland from the Bay.

2.64 In the 1870's there was a settlement at Beaver Bay, where Indians lived in order to work at the sawmills and lumber camps. The location of a burial ground associated with this community is also known.

2.65 Cultural resources from a later time and a different culture are located below the waters of what is now Silver Bay. The vessel, Hesper, was driven on the rocks and wrecked in May, 1905. Waves pulled the ruined steamer off the rocks and it sank into deep water. Today the wreck is partially underneath the west breakwater of the Reserve Mining Company. (See also para. 4.84 and exhibit 25.)

2.66 The precise areas of proposed development at Silver Bay are substantially disturbed by prior construction activities with heavy equipment associated with the Reserve Mining Company installation. No historic or prehistoric cultural materials were found in the remnant areas of undisturbed sediments.

LUTSEN (SCHROEDER)

2.67 The project site is located at the mouth of the Cross River, on the left, or northeastern bank of the river. It is immediately across the river from the site of the Schroeder Lumber Company Sawmill which was in operation during the late 19th and early 20th centuries. This is an historically significant site since the Cross River was one of the few rivers along the North Shore which was used to transport logs during the early logging days. Cut logs were accumulated upstream behind rock dams. When the dams were broken-out the water carried the logs downstream to the sawmill at the river's mouth. Bank shoring and iron mooring rings are still in place on both banks of the river. In addition a variety of iron and leather artifacts were found in the project area. The worn and broken condition of the tools suggests that they were discarded from the lumber camp.

2.68 On the same side of the river and immediately adjacent to the project area, right at the mouth of the Cross River is Father Baraga's Cross. This site and monument commemorate a fortuitous crossing of Lake Superior by the Missionary priest in 1846.

2.69 Within the project area there is a house foundation dated to the early 20th century. Some sherds of historic crockery were found in association with the foundation. The old house foundation and the artifacts associated with it were judged not to have significant value as cultural resources.

2.70 A rock quarry, a proposed disposal area and two gravel pits which may be used for the project were investigated and found not to contain cultural resources.

2.71 Copies of the finalized contractor's report have been furnished to the National Park Service, the State Historical Preservation Officer, and the State Archaeologist for review. Their comments are provided in exhibits 21-23.

2.72 The history of the community of Silver Bay is short. Around 1953, with the construction of the world's first large-scale commercial taconite processing plant on the Lake Superior shoreline, the city came into existence. The Reserve Mining Company began its construction of the taconite processing plant in 1951, and it went into operation in October 1955. A commercial harbor for shipping the processed taconite was also built at the time. Since then, Reserve Mining has followed an extensive, continuing program of adding facilities and enlarging existing equipment. In 1966, the construction of a \$5 million research and development complex, including water laboratories, was completed.

2.73 Silver Bay was originally built by Reserve. Located just minutes from the Reserve facilities, Silver Bay is a planned community unlike the "mining camp" and "company town" of the past. Most of the homes are single-story, three-bedroom structures with full basements. Some are split-level or two-story houses. More than 95 percent of the homes are privately owned.

2.74 Before Reserve's development, Silver Bay was a sparsely populated area; less than one person per square mile. Today, the community has the facilities customarily found in towns of comparable size for the educational, religious and recreational life of their residents. The public schools are of high quality. The high school, for example, has a swimming pool, rifle and archery ranges, fully equipped shops, indoor gymnasium, complete theater facilities, and specially designed rooms for choral and instrumental instruction. Silver Bay also has outstanding recreational facilities, including excellent bowling lanes, golf courses, tennis courts, baseball and softball diamonds, skating and hockey rinks, rifle and archery ranges, teenage centers, and community auditoriums. There are many clubs and organizations which contribute to the active life of the community.

2.75 As noted earlier, the community of Schroeder was first settled as a logging community. Over the years, the logging industry decreased in importance. Around the late 1920's, the town of Schroeder disorganized. The population was then approximately 250. Erie Mining, which located near Schroeder around 1950, gave an important boost to the economy of the town and is presently a primary source of its income. The community was reorganized into a town in 1972.

SOCIAL CHARACTERISTICS

2.76 Silver Bay became incorporated as a village in October 1956 and is administered by the mayor-village council system of government. (Over the past year Silver Bay has been reclassified as a "city".) The Lake County seat is located in Two Harbors, Minnesota. The present census of Silver Bay shows a population of 3,405. Like most American communities, Silver Bay elects its own officials and maintains its own fire and police departments and water and sewage systems. In 1967, Reserve Mining taxes contributed \$4.1 million to State and local taxes.

2.77 The unemployment rate at Silver Bay has been low. Over 80 percent of those employed work at Reserve Mining, which is a 24-hour day year-round operation with an annual production of 10,800,000 tons of iron-ore pellets, 12 percent of the total U.S. output. Besides the 1,250 workers employed by Reserve Mining, there are four to six jobs in related industries for every person directly employed. Unlike most of the north shore communities, there is no tourist trade in Silver Bay nor is a tourist industry expected to develop in the near future. Typical of the north shore area, there is little agriculture, since the soil and climate of the region are not conducive to such. Less than 0.5 percent of the total area of Lake County and 0.3 percent of the total area of Cook County are used for agriculture. Hay is the most common crop where agriculture is used.

2.78 Schroeder became incorporated as a town in March 1972 and is administered by a town board, consisting of a clerk, treasurer and 3 supervisors. The Cook County seat is located in Grand Marais. The 1970 census showed a county population of 3,423 persons. The present population of Schroeder is 318 persons.

2.79 There are few sources of employment in Schroeder. Erie Mining is a primary source of employment hiring over 100 Schroeder residents. The tourist trade also functions as an important base of employment. A number of residents are self-employed in retail sales, a couple more are involved in the lumbering business, and a few commute to Silver Bay to work at Reserve Mining. One person is a part-time commercial fisherman.

TRANSPORTATION

2.80 Silver Bay is located on U.S. Highway 61, about 54 miles northeast of Duluth. A private, intra-plant, double track railroad 47 miles long, running between Babbitt and Silver Bay delivers the iron-ore from the mining site to the processing and shipping site. Otherwise no rail passenger or freight service is available. The Northern Transportation Company provides daily bus service to and from Silver Bay. There is also a municipal airport; however, all the planes are privately-owned and there is no charter service. The nearest passenger airport is at Duluth where regular flights are scheduled for travel in several directions.

2.81 Schroeder, located on U.S. Highway 61, is about 80 miles northeast of Duluth; daily bus service is available. The nearest passenger airport is Duluth, where car rental service is also available.

FUTURE ENVIRONMENTAL SETTING WITHOUT THE PROJECT

2.82 In the years since project authorization, the two deep-draft private harbors, Taconite Harbor (31 miles southwest of Grand Marais) and Silver Bay (23 miles southwest of Taconite Harbor) have been constructed. These two facilities would provide some refuge for small craft from unexpected storms, although they do not fulfill the requirements for harbors-of-refuge.

2.83 The future environmental setting without the harbors-of-refuge would be basically similar to that today. The number of persons presently boating for any distance along the North Shore would continue to be limited, even with Silver Bay Harbor and Taconite Harbor in place. Both harbors are large, limited in available quiet-water areas during storms, and lack any provisions for the casual recreational boater. Realizing the need for a harbor-of-refuge in the Silver Bay area, the Reserve Mining Company presently extends its hospitality to any boater who must seek refuge in its harbor. This usually includes driving the persons into town.

3. RELATIONSHIP OF THE PROPOSED ACTION TO FUTURE LAND USE

3.01 The Arrowhead Regional Development Commission has been on record for the past 7 years as supporting harbors-of-refuge at Beaver Bay and Lutsen. At this time, the Commission, in conjunction with various State agencies (Environmental Quality Council, Highway Department, Pollution Control Agency, Department of Natural Resources, Health Agency and the Economic Development Agency) and local representatives, has begun work on a coastal zone management plan which includes the North Shore of Lake Superior. The Federal legislation authorizing this study program was passed by Congress in 1972; the program was funded in 1973 (two-thirds Federal, one-third State). The purpose of this management plan is to make an appraisal investigation and study, including a review of any previous relevant studies and reports of the coastal zone and to develop recommendations for the management of lands, the use of which have a direct and significant impact on the coastal waters. The 3-year program, rather than curbing industrial or commercial development, is meant to regulate the locations where the development is to take place. A State law, which can be implemented as a tool by the Coastal Zone Management Plan, is the Critical Areas Law, which is a program to manage areas of more than local significance which are under potential development pressure. Should an area be declared a critical area, the various local and county governments of the concerned area must meet and put together a zoning plan for the area which, in turn, must be approved by the Environmental Quality Council. The purpose of this is to have the critical area under uniform rules and regulations serving State and regional as well as local interests. Though an area might be declared a "critical area," it does not necessarily follow that all further industrial, commercial, or residential construction shall be prohibited for the entire area. In fact, it is highly unlikely. (See exhibit 12, page A-15, for a letter of confirmation from the Planning and Zoning Office, County of Lake, Two Harbors, Minnesota, and exhibit 13, pages A-16 to A-19, for a resolution of the Cook County Board of Commissioners confirming the Lutsen project.)

3.02 The Silver Bay harbor site is in an unincorporated area under county zoning jurisdiction. The classification states that uses for the affected area are "residential and recreational," and, as such, the project is compatible with local objectives and associated land uses adjacent to the proposed harbor. Local zoning ordinances are felt to be adequate to regulate future land use near the harbor to insure compatible development. The Schroeder harbor site area is basically zoned C-1, with a few spot zones of C-2. The commercial recreation district extends approximately 1/2 miles on either side of the Cross River and up to Highway 61. While the harbor-of-refuge is compatible with the local planning objectives, construction of the project would necessitate the removal of two cottages. Major amendments are being made to the local zoning ordinances, and it is anticipated that the ordinances will be adequate to regulate future land use near the harbor to insure compatible development. Work has begun on a coastal zone management plan, as indicated above.

3.03 If the harbor is built, certain activities can be expected. Adverse effects of spin-off activities will be held to a minimum by local land use plans and zoning. Beneficial effects would include increased taxes and employment, and better services and facilities for the users of the harbor.

4. PROBABLE IMPACTS OF THE PROPOSED ACTION ON THE ENVIRONMENT

STRUCTURES

GENERAL

4.01 The proposed breakwaters at the Silver Bay harbor site would cover 0.5 acre of existing lake bottom and 0.05 acre of land area. Initial dredging is expected to remove 13,637 cubic yards of material from the harbor site basin, encompassing an area of approximately 2 acres.

4.02 The proposed breakwaters at the Schroeder harbor site would cover approximately 3 acres of lake bottom and approximately one-tenth of an acre of land area. Initial dredging would remove approximately 2,890 cubic yards of material from the harbor site basin, encompassing an area of approximately 1.5 acres.

4.03 The breakwaters would act to break or moderate the effects of storm-driven waves and to provide relatively slack water areas for small boat refuge. However, when storm winds are directly in line with the entry at either harbor, storm waves could create turbulent conditions in a localized area immediately ahead and adjacent to the opening, creating a hazardous navigation situation. Storms in line with the proposed harbor entries are not a common occurrence, however. The structures would tend to channelize mass flow currents entering or leaving the harbors and could cause changes in the configuration of the adjacent shoreline areas and contribute to erosion by interrupting the littoral drift and longshore currents. Littoral drift is defined as the sedimentary material moved along the littoral zone and currents generally in the same direction along the lake shore which tend to move and redistribute sand along the shore. The littoral drift at the western end of Lake Superior is generally from the northeast to the southwest on both shores except for isolated locations. All material generally moves toward Duluth-Superior. Thus, the potential exists at each proposed harbor site for accretion to occur along the shore adjacent to the lake side of the easterly breakwater and soil erosion to occur along the shore adjacent to the lake side of the westerly breakwater. However, littoral drift should be small and consist mostly of gravel. The Corps does not anticipate any significant problems which can not be taken care of in the project designs.

BENTHOS

4.04 Records indicate that, although benthic (bottom dwelling) populations are relatively scarce in Lake Superior, the lake bottom does support viable populations of these life forms. Those animals dwelling directly in the path of the breakwaters would be covered and thus eliminated by project construction.

4.05 Considering the large amount of lake bottom contained within Lake Superior, the amount that would be covered by the proposed breakwaters and any future structures is considered relatively small; however, the loss of it and the benthos which would be destroyed constitute a definite adverse impact.

4.06 Construction of the landward ends of the proposed breakwaters would kill the organisms living on this substrate during construction. However, this land is composed mainly of ledge rock and boulders and is similar to that which would be provided under project conditions. Therefore, these organisms could probably be reestablished in time.

FLORA

4.07 There would be little vegetation affected by the landward ends of the breakwaters. However, it is also true that the severe growing conditions would prolong the period of possible recovery. Any further development of the harbor areas, which would be induced by construction of the harbors, would also have an adverse effect on vegetation.

FAUNA

4.08 No endangered animal species have been identified which would be significantly affected by the project, although it is recognized that the harbor and associated activity could adversely affect portions of the wolf pack territories. This is not expected to be significant, however, as the wolf packs tend to use the area near the lake mostly in winter, when there is no har or activity.

4.09 Land used for actual construction of the harbors-of-refuge as well as future induced secondary development by local interests would constitute a habitat loss for wildlife in the area. Although the areas are not extensive it should be recognized that habitat losses seldom come in large quantities.

FISH

4.10 Permanent structures in lake and harbor water tend to exert an effect on the kinds and numbers of organisms, both plant and animal. Communications with biologists from the Minnesota Department of Natural Resources, University of Minnesota at Duluth, U.S. Fish and Wildlife Service, and local sportsmen, indicate that a structure such as a breakwater might possibly be a desirable addition to the lake for purposes of this habitat improvement. Evidence supporting this concept is the rubble-mound breakwater at Two Harbors, Minnesota. Constructed in 1971, this structure has become a popular fishing site. At least two factors appear to be contributing to this. First, it provides access to the lake for fishermen who do not have a boat. Second, the rocky structure projecting from the lake bottom probably provides a microhabitat which is conducive to algae and invertebrate production.

4.11 While the submerged rubble-mound portions of the proposed breakwaters would not provide exactly the same type of substrate that naturally exist on the lake bottom, certain benefits might possibly be assigned to the breakwaters.

4.12 Permanent structures would introduce wood, metal, concrete, rubble and rock to the water where none existed previously. Breakwaters along a relatively unsheltered coastline not only provide an area of calm water for navigational purposes but also provide a relatively calm and sheltered area for species which would not normally be found in this type of location. Increases in certain species can be expected in areas of reduced wave force. With the increased production of algae and aquatic invertebrate animals due to the substrate provided by the submerged rubble, and with good cover available in the rock crevices, smaller forage and game fish could be attracted to the breakwater. These, in turn, may attract larger carnivorous sport fish. Should these conditions develop for the rubble-mound portion of the proposed breakwaters at the Schroeder and Silver Bay sites, the breakwaters would be an asset to the local sport fishery. However, these changes in habitat diversity, population distribution, and nutrient levels may not necessarily cause increases in the populations of species having high social value. (For example, small harbors having some rooted aquatic plant growth commonly support populations of bullheads, while the adjacent shoreline may not.)

4.13 The steel-cell portions of the proposed breakwaters would probably have little or no effect with respect to attracting game fish, but would provide a comfortable surface to fishermen to use.

4.14 The altered entrances to the natural bays by the breakwaters would reduce the flushing rate of the harbor and thereby potentially influence the species present and their numbers and density.

4.15 The U.S. Fish and Wildlife Service and the Minnesota Department of Natural Resources have been contacted regarding spawning grounds in the proposed harbor areas. While the entire Minnesota shore of Lake Superior is potential lake trout spawning ground, no critical spawning grounds have been identified at the Silver Bay site. However, the Cross River near the Schroeder harbor site is designed as a trout spawning stream.⁽¹⁾ Pink salmon enter the river every fall for spawning while rainbow trout and steelhead spawn every spring upriver and at the river mouth. An occasional brown trout also makes its way into the Cross River for spawning purposes. No critical spawning areas are expected to be eliminated by the placement of the proposed breakwater. A reply from the U.S. Fish and Wildlife Service regarding the proposed site at Schroeder has been received (see exhibit 20). They do not expect the development of the harbor to have any significant adverse impacts on fish and wildlife resources.

(1) Commissioner's Order, 1852, Regulations Designating Trout Streams.

CHEMICAL

4.16 The building and physical presence of structures such as breakwaters, piers, docks, and navigational aids constructed of materials foreign to the area or the harbor have certain potential chemical impacts upon the aquatic environment.

4.17 Breakwaters and piers may contribute trace amounts of various chemicals as a result of leaching of native rock, concrete or steel sheet piling after long submersion on the water. Piers or docks which use treated or galvanized steel pilings contribute zinc and small amounts of lead, cadmium and iron. As leaching proceeds over time, piers having treated timber pilings or cribs contribute oils and phenols. Painted or electrified navigational aids on breakwaters, piers, and docks contribute lead, zinc, copper, and other elements as they age and deteriorate while weathering. However, though the potential for long-term leaching of inorganic constituents from structures exists, it is usually considered minimal.

CONSTRUCTION MATERIAL

4.18 The rock, sand, and gravel proposed for use in construction of the proposed breakwaters are expected to come from existing quarries, sand and gravel pits, or local stockpiles. If the contractor selected uses these sources, excavation for procurement of material would involve an extension of present land uses, and little impact would be expected. If new sources are developed, the significance of the action would depend upon the environmental features at the quarry site and could vary from a minor impact to a significant one.

4.19 Rock for rubble-mound breakwater construction at Schroeder can be obtained from the Carlton Peak Quarry. This quarry is located approximately 3 miles from the harbor site. A quarrying operation would have to be set up at this location. Two sources of granular material are available adjacent to T.H. 61, approximately 1.75 miles from the construction site. It is proposed to use material from either of these sites for steel-cell construction.

4.20 At Silver Bay, rock for rubble-mound construction can be obtained from an abandoned quarry located immediately west of the proposed dredge disposal area. This site was used to quarry rock for the existing Reserve Mining Company west breakwater. A quarrying operation would have to be set up at this location. Another source of rock is Carlton Peak (discussed above) located about 30 miles northeast of the project site. It is proposed to use granular fill as cell fill. Aggregate sources are available west of the business district of Silver Bay. All construction materials would require tests to determine whether Corps of Engineers standards can be met.

AESTHETICS

4.21 Evaluation of aesthetic impacts is subjective and basically a matter of personal taste. In this case, aesthetic degradation is suggested by the change from the natural appearance of the site to a situation of less randomness and diversity and a greater number of straight lines.

4.22 In this regard, construction of the proposed breakwaters would have an adverse impact on aesthetic values through the introduction of straight-line features into the natural coves. This effect would be accentuated when the local interests complete construction of the harbor facilities (wharf, buildings, etc.). Further aesthetic degradation could occur if the rubble-mound portions of the breakwaters were not constructed of rock having similar coloration to that naturally surrounding the coves. Although the rubble-mound features would be constructed of rock native to the area, the bedrock along the North Shore exhibits considerable variation in appearance. During preparation of specifications for the construction contracts, consideration would be given to specifying that rock used during construction should have a similar appearance to that at the harbor sites.

4.23 The rubble-mound breakwaters should appear and act as rocky reefs projecting from the lake bottom. The steel-cell portions of the breakwaters would present a broadside view to an observer on the lake and would probably appear as artificial walks along the shoreline. At Schroeder, the steel-cell portion of 215 feet total length would have little visual impact when compared with the 1,195 feet of rubble mound. The steel cells would develop a coating of rust. However, as the cells would be capped with grouted rock, their aesthetic appearance should be more pleasing.

4.24 At Silver Bay (Beaver Bay), the 491-foot-long steel cell portion would have a major visual impact. The steel cell portion would disrupt the appearance of the rock shoreline. The view from the shore overlooking the lake and from the lake looking toward the shore will be altered for the life of the project. Views which include the steel cell portion of the breakwater would be aesthetically less pleasing, giving a mechanical and technical impression.

4.25 Reaction to the aesthetic impacts could be expected to vary among the different sectors of the public. Project beneficiaries typically have a greater tolerance for aesthetic deterioration. They view the projects as directly or indirectly benefitting them economically, for example, and it is of no great concern if appearances suffer somewhat in the process. Those who place heavy emphasis on aesthetics are usually not affected in a direct social or economic way by the project work. They usually do not have a strong advocacy, although in this case the scenic qualities of the North Shore are sufficiently well-known so that concern for aesthetic qualities is strong. Given the scenic qualities of the area, the importance of any aesthetic impact is great. It has been noted in other harbors that breakwaters draw visitors even during Lake Superior storms. Sightseers and photographers come to watch the waves furiously pounding against the structures.

TEMPORARY IMPACTS DUE TO CONSTRUCTION

4.26 During the construction phase of the project, increased water turbidity in the immediate construction area would be anticipated. Potential environmental effects of turbidity include suffocation of some bottom-dwelling organisms and fish eggs spawned in the immediate construction area where turbidity would be greatest. However, construction procedures would be coordinated with the Department of Natural Resources and the U.S. Fish and Wildlife Service to assure that all necessary precautions and mitigative measures are taken to minimize adverse impacts.

4.27 Aesthetically, the increased turbidity would be displeasing. Lake Superior is noted for being a clear-water lake with low turbidity levels and even localized temporary turbid water conditions would detract from that quality.

4.28 Various types of boats, motors and mechanical equipment used in construction may contribute oils, grease or other chemicals to the harbor or open lake waters. Although normal caution is exercised to prevent accidental spillage of chemicals or oils and grease during construction and maintenance, a certain amount does enter the water through routine bilge pumping and the submersion of rock handling equipment.

4.29 During construction there would be increased noise, dust, and truck traffic. This increased traffic on Highway 61 might be a safety hazard and result in increased maintenance costs for the roadway. Short term impacts to air quality may result as diesel exhaust from the motors above the barges, tugs and tenders must be vented into the air. Dust at both the construction sites and the borrow areas would be expected. Although these impacts are of a temporary nature, they have the potential to be annoying and disruptive. Since there is low local population, the effect on the human environment is not considered significant. The location of dredges, scows, barges and other large pieces of equipment at the proposed harbor sites will not, during the construction process, cause traffic congestion as previous to construction there is no harbor or boat activity. It is not anticipated that construction activities would interfere with Reserve Mining's commercial ship movement.

DREDGING

4.30 As stated previously, construction of the proposed harbors would require dredging approximately 13,637 cubic yards at the Silver Bay site and 2,890 cubic yards at the Schroeder site. Excavation at Silver Bay would include blasting solid rock.

4.31 Presently, it is not known what type of dredge would be utilized for the initial dredging of the harbor bottom; however, it would have to be a mechanical dredge since the rocky nature of the proposed harbors prohibits the use of a hydraulic dredge. A mechanical dredge operates by dropping its bucket into the lake bottom and obtaining a scoop of bottom material. The impacts of specific types of mechanical dredges are primarily the same.

TURBIDITY

4.32 The act of dredging, by its very nature, creates a certain amount of turbidity which can be characterized as muddy or sediment clouded water. Digging, disturbing, and removing bottom sediments tends to churn up the bottom. Lifting a bucket load of sediments through, and out of, the water also results in turbidity as "mud" washes out of, or overflows from, the dredge bucket.

4.33 The act of dredging tends also to redistribute and resuspend some of the finer sediment material which may be found at the sediment-water interface. After dredging has ceased, this fine material, which has been resuspended as turbidity, would settle out and be redeposited in both the dredged and the adjacent undredged areas. The amount of fine, easily disturbed sediments, therefore, may often be greater in the adjacent undredged areas because they represent the original state plus some of the additional material stirred up by dredging.

4.34 The amount of turbidity is related in part to the nature of the bottom sediments being dredged. Sand and gravel create relatively little turbidity, while clay and light organic "muck" will create more turbidity. Generally, however, the "plume" of dredged induced turbidity is of relatively small extent and short duration. Due to the rocky bottoms of the proposed harbors, little turbidity is anticipated at either proposed harbor site.

4.35 Although the full effects of turbidity cannot be evaluated in all situations, the general effects of turbidity are known and, depending upon the duration and extent of the turbidity produced, it is clear that this factor may have an important environmental impact. The most obvious effect is a reduction of light penetration into the water. In most cases the reduction of light penetration is of relatively short duration and would have relatively little effect upon the light requirements of sensitive organisms. Sedimentation on the adjacent lake bottom would adversely affect existing populations of bottom dwelling organisms.

4.36 More subtle, and therefore more difficult to accurately estimate, are the effects produced upon aquatic life and water quality in the area of the operating equipment. Turbidity clouds and associated release of oxygen consuming nutrients, especially where dredging of highly organic sediments is being done, can be expected to reduce the dissolved oxygen level of the surrounding water to the point where certain sport fish with high oxygen needs would be driven off. On the other hand, the same nutrient releases may, over a period of time, result in higher plankton levels and an influx of rough fish, and over a long period of time result in possibly a higher biomass and greater species diversity in that part of the harbor. Another effect of turbidity is the abrasion of respiratory surfaces of aquatic organisms.

4.37 Turbidity also affects resuspension, redistribution and related solubility, and accelerated oxidation or reduction of various oils and grease and heavy metals such as lead, zinc, mercury, and copper. All of these substances are toxic to living organisms, although it is as yet not fully known to what extent dredging-influenced turbidity influences toxicity concentrations. The adverse effects of dredging regarding the above phenomena are expected to be minimal because there would be a high concentration of bedrock and large boulders and a small amount of the fine sediment associated with adverse environmental effects. As indicated on page 14, taconite tailings are deposited on the bottom over much of the western part of Lake Superior. Thus dredging of the harbors may stir up and resuspended tailings that have already settled, resulting in redistribution and increased dissolution of the tailings. Resuspension of asbestiform fibers, the origin of which is claimed to be the taconite tailings, may also occur. Refer to paragraph 2.31 for more detailed information regarding the potential impacts of these taconite tailings.

WATER CONTAMINATION

4.38 All of the Corps operated equipment associated with maintenance dredging and breakwater repair is equipped with sanitary holding tanks for containment of on-board generated wastes. However, a certain amount of water quality impairment exists as a result of the dredging-induced turbidity, discussed above, and as a result of waste oil and grease from bilge pumping and equipment operation. On 1 July 1974, Kieme Bilge Water Filtration Units were installed on board the GAILLARD and COLEMAN to remove oil and other contaminants. Other Corps vessels working in conjunction with the GAILLARD and COLEMAN can pump their bilge water into the filtration units.

NOISE

4.39 Noise associated with the operation of the dredge is very substantial. The use of large mechanical equipment results in noises associated with the motors, the winches the raising and lowering of the dredge bucket. However, the noise from dredging would occur only during "normal" working hours.

CHEMICALS

4.40 Dredging removes material from the top of the sediments which have accumulated on the harbor bottom. Removal of potentially toxic material associated with the sediments can have a desirable impact in reducing the supply available in the harbor.

4.41 Dredging, and its concomitant disturbance of bottom sediments, causes a temporary resuspension of some of the fine particles as discussed in paragraphs 4.32-4.37.

4.42 Resuspension of fine particles can lead to an increased concentration of nutrients and organic material in the vicinity of the turbidity plume, with the added possibility that a transient toxic environment may be created for fish and other aquatic life. If the sediments contain specific toxic elements such as metals, the process of redistribution which accompanies dredging may raise the level of these potentially toxic materials to the point where they threaten the living organisms in the aquatic environment.

4.43 In addition to resuspending physical particles, dredge-induced turbulence also brings soluble chemicals from the sediments into solution in the water. In warmer and more eutrophic waters this addition of nutrients and chemicals may have a direct impact in causing temporary algae blooms. In the colder Lake Superior waters, however, heavy blooms have not been observed. The increased concentration of available nutrients would be expected to support larger plankton populations, but not to the extent that nuisance blooms would occur. It is expected that dredging at the Schroeder and Silver Bay sites would have negligible adverse effects on water quality as the sediments that have been identified with moderate or high levels of heavy metals are almost exclusively outside the area of proposed dredging. The area to be dredged does not have a high concentration of fine sediments. Dredging operations at Silver Bay are also expected to have negligible adverse effects. Only one sample from the area to be dredged had high PCB values and repeat testing did not confirm the presence of PCB's. The majority of the dredged material will be rock, so the adverse environmental effects will be negligible and last no longer than the dredging operation.

4.44 The introduction of chemicals into solution is considered to be one of the unavoidable impacts of dredging, using currently available equipment.

BIOLOGICAL

4.45 The surface layers of the sediment support an appreciable population of benthic (bottom dwelling) organisms which are characterized by a relatively high species diversity. The act of dredging removes not only the accumulation of sediments, organic matter, nutrients, and other materials associated with this surface layer, but it also removes these benthic organisms. On this basis, it is apparent that the newly exposed layer of sediments which remains after dredging would have a reduced amount of organic matter and fine material in it, and in addition would have fewer benthic organisms than before. The potential also exists for an overall reduction in species diversity.

4.46 The impact of destroying the benthic community, however, seems to be relatively short-lived (as opposed to habitat alteration). The rapid rate of reproduction and the likely residual of relatively large numbers of benthic organisms which would float or fall out of the dredge during the act of dredging are factors which would apparently result in a rapid recolonization and reestablishment of at least some members of the benthic community. It appears that in some instances this may be achieved within months after the dredging operation has ceased.

4.47 In relatively "clean" dredging operations, where the major portion of the light and fine clays, silts and organic materials, as well as the underlying sediments, are removed; an area of sediment having a larger average particle size and greater average density is exposed. Because of this increase in particle size at the surface, the new surface would probably contain lower concentrations of absorbed material such as organics, nutrients, and heavy metals.

HABITAT ALTERATION

4.48 If a totally new environment (habitat) were exposed by dredging, a different benthic community would be expected to develop. New dredging involves exposure of sediments which have not been exposed to the aquatic environment.

4.49 The rate at which a benthic community reaches equilibrium after dredging operations has not been documented. Organisms may, in fact, return relatively rapidly, but the symbiotic relationships between various species suggest that a transitional benthic community would be established shortly after dredging, and that it would probably take a period of years before a stable benthic community reestablishes itself, depending upon impacts of harbor use.

ORGANIC MATTER REMOVAL

4.50 The material at the sediment-water interface is frequently high in both organic and chemical components. This material tends to be both chemically and physically active. Decay of organic material tends to produce an anoxic (oxygen depleted) condition at the water sediment interface. The anoxic condition at and slightly above the interface results in anaerobic decomposition of organic and other matter in the sediments at that point. Harbor areas where high organic levels and correspondingly low oxygen levels occur would be generally unsuited for higher forms of game or commercially valuable fish, whose respiration is dependent on high dissolved oxygen levels, but would be instead frequented by other species such as bottom feeding rough fish which have a lower dissolved oxygen requirement.

4.51 Removal of the organic material by dredging is expected to reduce the oxygen demand on the water at the interface. The waters of Lake Superior, however, are normally high in dissolved oxygen throughout the year; it is, therefore, unlikely that changes in the oxygen demand of areas in the proposed harbors at Lutsen and Beaver Bay would have a significant impact on fish habitat from this point of view.

BLASTING

4.52 Populations of benthic organisms and plankton in Lake Superior are very low. Blasting operations would remove these populations in the project vicinities; however, it is expected that new communities of benthic organisms would be established.

4.53 Fish in the immediate area of the blast would also be destroyed. The activity of drilling and setting the charges may drive some of the fish from the blast area, although they would return following dredging activity. To lessen adverse effects, all blasting activities would be coordinated with the Minnesota Department of Natural Resources and the U.S. Fish and Wildlife Service.

DREDGE MATERIAL DISPOSAL

4.54 An on-land dredge disposal program is proposed for both harbors; the impacts of on-land disposal and related activities are discussed below.

BEACH NOURISHMENT

4.55 Beach nourishment would utilize large boulders dredged from the harbor in a practical manner, representing a recycling of a valuable natural resource. Dredged material would only be placed at or above the water line for the purpose of riprap, and only at the Silver Bay project site.

CONSTRUCTION RESOURCE

4.56 Like beach nourishment, utilization of dredged sediments as a construction resource for road repair or breakwater fill material would utilize the sand, gravel and stone dredged from the harbor in a practical manner, representing a recycling of a valuable resource. However, temporary stockpiling of the sediments on the lake shore prior to its being hauled away would occur. The potential would exist that rain, meltwater or some other natural or human activity could carry possible contaminants back into the lake before removal of the sediment. The possibility of leaching can be reduced, although not eliminated, by allowing stockpiling near the harbor for only short periods of time (days). Possible leaching of contaminants into the lake could continue if the dredged material were utilized as fill in the breakwaters.

ON-LAND

4.57 Confined or on-land disposal is seen as a means of delaying natural and culturally-induced eutrophication of the harbor and open-lake waters. Confinement of bottom sediments would result in much less potential for heavy metals, toxic materials, and other pollutants being contributed to a harbor or open-lake ecosystem.

4.58 Disposal of the polluted material must be accomplished in a way that will insure that the undesirable material does not have adverse effects on the total environment. Of particular significance in this regard are any high concentrations of potentially toxic heavy metals in the material and the possible leaching of these heavy metals (or other toxic or pollution material) to the disposal site surrounding or, in the case of volatile substances, to the atmosphere. (This has been a major concern in other harbor on land disposal programs. However, for Knife River Harbor at least, studies seem to indicate that the possibility of leaching poses no long-term detrimental effects to the environment. Leachate tests done in December 1974 on two polluted sediment samples taken from Knife River Harbor indicated that there should be little risk using Knife River dredge material for cover material on the old Knife River dump.) Short-term storage of the dredge material on the shoreline prior to final disposal could allow leaching of certain chemicals back into the harbor. The potential for adverse environmental effects is lessened because the material to be dredged is mostly rock. The dredged material will not have large amounts of fine sediments which are associated with the potentially harmful and/or toxic elements of the dredge material.

4.59 An obvious result of either on-land or in-harbor confinement of polluted dredge material is the extensive utilization of space involved in holding the polluted dredged material. Disposal of polluted dredge material on land will subject the material itself to wind and water erosion.

4.60 For on-land disposal at the Schroeder site it is proposed to place the excavated material from the Schroeder site in an area adjacent to the haul road leading to the Carlton Peak quarry site (see exhibit 4). At the Silver Bay site, excavated material could be placed in an area west of the harbor site (see exhibit 5). Care would be taken to prevent any significant adverse effects on the ecosystem of the affected areas. According to a letter from the U.S. Fish and Wildlife Service (see exhibit 20), the proposed disposal site for Schroeder appears to be an acceptable site. They anticipate minimal adverse impacts on the wildlife resources in the area.

4.61 A dredge disposal site initially will be little more than a barren detrital area devoid of vegetation. As such it will present a new environment for primary succession. The type(s) of vegetation that will succeed on a disposal site is a function of several interrelating factors. If the dredge sediments are simply deposited in an area, the main factors affecting vegetation seem to be: (1) substrate condition; (2) moisture; and (3) exposure and (4) kind of seed available. Micro relief is also important.

HARBOR UTILIZATION

4.62 Increased use of the sites would result with the construction of the harbors-of-refuge and associated recreation development. More pollution in and around both sites is anticipated. This pollution may adversely affect the local populations of some aquatic organisms. Probable sources of water pollutants would be increased exhaust emissions from boat motors, possible fuel spillages and debris discarded by the ever present litterbugs. A significant pollution problem is not expected to be generated by increased recreational traffic. However, oils, grease, organic materials, nutrients and heavy metals generated by the increased recreational boating would eventually settle to the harbor bottom and become mixed with and incorporated into the bottom sediment. Noise pollution could result from an increased level or duration of sounds associated with boating. It is expected that noise levels would peak on weekends during the boating season and would be minimal during weekdays when boat usage is not as great. It is not expected that recreational boat traffic at the Silver Bay harbor-of-refuge would interfere with the movement of ore from Reserve Mining's harbor.

4.63 Harbors-of-refuge are usually subjected to secondary development. In these instances access roads, parking areas, boat launching ramps, sanitary facilities and public wharves are associated with these small boat harbors. In some cases, marinas and/or parks and campgrounds have been developed. Frequently, a harbor is an asset to the neighboring town's desirability as a tourist spot and has thus induced construction of tourist related facilities such as gift shops, bait and tackle shops, restaurants, motels, etc.

4.64 This secondary development, in turn, has beneficial and adverse environmental, socioeconomic, historical and archaeological impacts. Depending on its size and location, any construction project will affect to varying degrees the flora, fauna, fish, benthos, water and air quality, aesthetics, and socioeconomic characteristics of the surrounding region. A discussion of these impacts would be similar to that presented in this EIS for the construction, operation and maintenance of the two proposed harbors-of-refuge. Adverse impacts upon the flora have been minimized by using the existing access road alignment as the base for the proposed access roads for the proposed recreational development.

4.65 In this instance, there is not much secondary development expected for either of the two proposed harbors, though both harbors are being designed for the eventual construction of minimal berthing facilities. At this time a boat access, restroom and picnic and parking facilities are being proposed at the Schroeder and Silver Bay sites. No further development is anticipated for the near future at either harbor. Rather, the proposed harbors will serve primarily as harbors-of-refuge.

SOCIOECONOMIC IMPACTS

4.66 The proposed breakwaters would provide harbors-of-refuge for boaters and improve the safety of navigation on Lake Superior. A reduction in damage to boats moored in the harbor during storms would result. The Corps considers the potential life- and property-saving benefits to be derived from the shelter provided by the project as sufficient justification for construction, operation and maintenance of the two harbors, though neither are expected to grow into centers of booming commercialism. No significant economic impacts to the local areas are expected with the provision of harbor facilities by the local interests. Any economic gain at all would be associated with businesses of the tourist industry, in particular the small-boat trade. Adverse social and economic impacts attributable to the proposed project would accrue mainly during construction. Beneficial socioeconomic impacts would occur as well during construction, operation and maintenance activities as money would be spent directly in the respective communities for groceries, supplies, entertainment and the like.

4.67 Since summer residences adjacent to the Schroeder harbor site would be occupied during construction, certain constructional procedures would be necessitated to mitigate undue disruption to the affected persons. Dust caused by any of the construction activities would have to be abated. The entire east breakwater would have to be built from the lake surface as landowners and residents living adjacent to the east breakwater preclude utilizing any land access for construction purposes. The summer residents obtain their potable water supply from the lake in the proposed harbor area. These water supply lines cannot be cut off and must remain operational during and after construction. It is the responsibility of the local sponsor to provide water for adjacent residences.

4.68 Beneficial socioeconomic impacts would occur as well during construction, operation and maintenance activities as money would be spent directly in the respective communities for groceries, supplies, entertainment and the like.

4.69 With the new harbors, increased volumes of tourists and recreationists along the North Shore may be expected.

4.70 Schroeder is a tourist community with its economy based on the Erie Mining industry and tourist trade. It is speculated that a harbor-of-refuge would enhance this sector, making a bright outlook for tourist-oriented businesses. Presently, however, little secondary development of the harbor or economic impact is expected.

4.71 Silver Bay is not a tourist community. Its economy is based on the taconite industry. Although Silver Bay will not benefit from the tourist trade, the village is very anxious for a harbor-of-refuge. Already a number of persons in the community possess boats but have no place to keep them. To launch their boats they must go approximately 3 to 7 miles to King's Landing, a small boat launching area with a shed for storage of a limited number of boats. The sandy approach condition of the dock and the small size of the landing make any launching of a boat a difficult and time-consuming process. Furthermore, in the event of a storm, King's Landing would not be able to handle more than a few boats at a time. With a harbor-of-refuge it is thought that more residents would purchase boats and spend their leisure hours on Lake Superior.

4.72 The proposed harbors-of-refuge would not appreciably affect the cohesion, growth, business or labor forces, tax revenues, and property values of the communities involved. The proposed sites are not in agricultural areas, and at the Silver Bay site no displacement of any permanent residents would be required. However, the lands necessary for the proposed harbor at Schroeder are owned by three or four private interests, and construction of the project would require the removal of two rental cottages.

4.73 Some loss of business and tax revenues would result from buying of property and removing the two cottages. Occupants of the remaining private and rental cottages would be subject to the negative effects of a changed view of the lake and possible distraction by activity at the harbor. These negative effects and changes in property value of the cottages would probably have very little impact if the primary interest of the renters or future owners of the cottages was in using the harbor for boating on the lake.

RECREATION

4.74 For the proposed recreation facilities, recreational usage of the proposed harbors and adjacent area would increase significantly. Because the size of the recreational resource base is limited, annual use projections are based upon the capacity of the resource. Schroeder has a visitation capacity of 8,910 recreation days per year, and Silver Bay's visitation capacity is 13,500 recreation days per year. The recreation days attributable to the basic Harbors-of-Refuge project are 1,475 for Schroeder and 1,700 for Silver Bay.

4.75 It is believed that the recreation resource would be used to capacity. Existing usage now consists only of occasional sightseeing so the net increase due to proposed recreation development would be close to 7,445 for Schroeder and 11,800 for Silver Bay. If the harbor and recreation facilities are built, some spin-off activities can be expected. The adverse effects of spin-off activities will be held to a minimum by local land use plans and zoning. Beneficial effects would include increased tax base and employment opportunities, and additional services and facilities for the users of the harbor.

THE IMPACTS ON STATE GOVERNMENT OF ANY FEDERAL CONTROLS ASSOCIATED WITH THE PROPOSED ACTION

4.76 The primary impacts of Federal controls associated with the proposed action are mostly directed at the local interests of Schroeder and Silver Bay as detailed in paragraph 1.08. However, both Schroeder and Silver Bay are eligible for State Natural Resources Fund Assistance, and the State of Minnesota will be funding one-half of the eligible local share of the cash contribution for the two harbors. If secondary development is to occur, it is very probable State permits would be required for many of the projects. It is possible there would be some degree of change in land use for the project areas with some indirect effect upon the State, for example, through the county-administered shoreline management program. It is also conceivable that the minor developmental pressures may contribute to the pressure for critical area designation for the region.

THE MULTI-STATE RESPONSIBILITIES ASSOCIATED WITH THE PROPOSED ACTION

4.77 No impacts of the proposed action upon multi-State responsibilities are anticipated, nor are there expected to be any significant environmental effects of the action upon adjacent States.

OPERATION AND MAINTENANCE

4.78 As stated in paragraph 1.22, operation and maintenance activities at the proposed harbors-of-refuge would include breakwater repair, dredging and dredge material disposal. Temporary congestion during repair, dredging or disposal may result when the equipment is located in the navigational areas of either harbor. Congestion in the proposed harbor-of-refuge at Silver Bay is not expected to interfere with the movement of iron ore from the commercial Silver Bay harbor.

BREAKWATER MAINTENANCE

4.79 Breakwaters would require frequent and extensive maintenance. Ice at this Lake Superior shoreline is very heavy and has a tendency to move. Lake Superior waves caused by storms from the northeast are the highest of all Great Lakes waves. From shipboard, waves have been recorded reaching a 23-foot height. However, waves of this type have occurred at a frequency of only about once in every 50 years and lake bottom configuration in front of the harbors will cause some loss of energy of the very high waves before the breakwaters are reached. The extreme storms can be expected during early spring or fall.

4.80 Maintenance would consist primarily of replacing rock torn from the breakwaters at the Silver Bay and Schroeder harbor sites during the Lake Superior storms. Breakwater maintenance would utilize the Corps of Engineers floating plant as described in paragraph 1.12. This equipment may contribute oils, grease or other chemical compounds to the harbors or open lake waters. Although normal caution is exercised to prevent accidental spillage of chemicals, or oil and grease, a certain amount does enter the water through routine bilge pumping and the submersion of rock handling equipment.

DREDGING

4.81 As indicated in paragraph 1.15, little or no maintenance dredging is anticipated for either harbor due to the "pocket" natures of the harbors resulting in no significant amount of fluvial sediment deposition, and the rocky nature of the harbor bottoms. Whenever dredging is necessary, the impacts would be the same as those described in paragraphs 4.30 through 4.51. The degree would depend upon the amount of dredging necessary.

DREDGE MATERIAL DISPOSAL

4.82 Impacts would be the same as those discussed in paragraphs 4.54 and 4.57 through 4.61, the degree depending upon the amount of dredge material to be disposed of. As stated previously, little or no maintenance dredging is expected at either proposed harbor.

IMPACTS ON CULTURAL RESOURCES

4.83 Within the actual project areas and the access rights-of-way there are no cultural resources which will be affected either beneficially or adversely. However, the projects may have effects on cultural resources located very near the project areas.

BEAVER BAY (SILVER BAY)

4.84 The wreck of the Hesper is not located directly within the right-of-way. However, the dredging and blasting of the harbor-of-refuge could have an adverse effect on the remains of the vessel. In compliance with the National Historic Preservation Act of 1966 and Executive Order 11593, the State Historic Preservation Office of

Minnesota was requested to apply the National Register Criteria to the Hesper (exhibit 24). It was his determination that the Hesper is not eligible for inclusion on the National Register because of its present condition (exhibit 25). We concur with this determination, and will not proceed further with the Advisory Council's "Procedures for the Protection of Historic and Cultural Properties." The information obtained by our contractor and subsequent conversations with the staff of the State Historic Preservation Office and with a local scuba diver who has visited the vessel, all indicate that the vessel has been seriously damaged by natural and man-made causes, and that there are few remaining artifacts.

LUTSEN (SCHROEDER)

4.85 Construction of the project will have an adverse impact on the artifacts and the house foundation which are located within the area. However, these materials have been determined not to have historical value. Therefore the adverse effects will not be mitigated.

4.86 Blasting is not presently scheduled for this harbor. If plans are changed to include blasting, precautions must be taken to insure that Father Baraga's Cross is not damaged.

4.87 The proposed recreational developments associated with this project have the potential for enhancing the surroundings of Father Baraga's Cross. If this potential is realized the project will have a beneficial impact on this cultural resource.

4.88 Construction of the project could have adverse impacts on the materials associated with the Schroeder Lumber Company Sawmill site. To mitigate these possible impacts the bank of the Cross River will not be disturbed during construction.

5. PROBABLE UNAVOIDABLE ADVERSE EFFECTS WHICH CANNOT BE AVOIDED

BREAKWATER CONSTRUCTION

5.01 By constructing the proposed breakwaters for the Beaver Bay and Lutsen harbor-of-refuge projects, some unavoidable adverse environmental impacts would be encountered. Approximately 0.5 acre and 3 acres of Lake Superior bottom would be covered by the breakwaters at Silver Bay and Schroeder, respectively. As a result, bottom dwelling organisms located in the path of construction would be directly affected. Although the area would be relatively small when compared to the remaining bottom surface area of the lake, the fact remains that a quantity of habitat would be lost if the proposed projects were constructed. In addition to the acreage affected by the construction of the breakwaters, there would be an undetermined number of acres of both lake bottom and land area involved with future construction of projects induced by the constructed harbors-of-refuge including the currently proposed recreational developments.

5.02 Increased water turbidity and sedimentation in the immediate construction area would be expected during construction and for a short time afterward. Some bottom dwelling organisms and any fish eggs spawned in these areas, both of which are easily suffocated by sediment, would probably be lost.

5.03 The altered entrances to the natural bays would reduce the flushing rate of the harbor and thereby potentially influence the species present and their numbers and density.

5.04 The areas where construction materials are obtained would be disturbed. Vegetation which might be established in these places would be eliminated as the structural materials are removed. Although appropriate landscaping and reseeding would restore some of the vegetative cover, it would be a period of several years before the disturbed areas would approximate natural plant communities.

5.05 Increased noise levels and possible airborne dust pollution are impacts which would be encountered during the construction phase of the proposed project. These effects could be expected at both the borrow areas and at the construction site. Although both impacts are of a temporary nature, they have the potential to be annoying and disruptive to human and natural environments. In addition a potential safety hazard can be anticipated because of the increased truck traffic that would be necessary to transport structural materials from the borrow areas to the construction site.

5.06 Construction of a harbor-of-refuge at Schroeder would result in the removal of two rental cottages.

DREDGING

5.07 The physical act of digging a hole in the harbor bottom causes several unavoidable effects, the most obvious of which is turbidity. Clouds of sediment are released to the water every time the dredge bucket or clamshell digs into, disturbs and removes a portion of the bottom sediments. Turbidity also results from overflowing and leaking dredge buckets, clamshells, and dump scows, and is produced also when equipment and scows are cleaned by flushing sand, mud, silt and organic material off the decks of operating equipment with jets of water from high-pressure hoses.

5.08 Although the full effects of turbidity are unknown in each instance in which it occurs, the generic effects of turbidity are known and, depending upon the duration and extent of the turbidity produced, it has been observed that these effects may vary considerably. The most obvious effect is the reduction of light penetration into the water. In most cases light penetration reduction is of relatively short duration and therefore could be presumed to have no long-term effect upon the ecosystem.

5.09 More subtle and hence more difficult to assess are the effects of the operating equipment on aquatic life and on water quality in the area being dredged. Turbidity clouds and the associated release of oxygen consuming nutrients, especially where organic sediments are being dredged, can be expected to reduce dissolved oxygen in the surrounding water and thus discourage the presence of sport fish.

5.10 Turbidity also affects resuspension, redistribution, and related solubility accelerated oxidation or reduction of various oils and grease and of heavy metals such as lead, zinc, mercury, and copper. All of these substances are toxic to life forms, although it is as yet not fully known to what extent dredging induced turbidity influences the toxicity concentrations of these substances.

5.11 In addition to turbidity, the physical act of digging and disrupting the habitat of various benthic dwelling organisms must be considered as one of the unavoidable effects of the dredging operation. Fish are mobile and are able to swim away from the dredge scoop or clamshell. Benthic organisms such as bacteria, fungi, worms, mollusks, insect larvae and crustacea must be considered relatively immobile and are therefore subject to being dredged up along with their habitat. Preliminary investigations have indicated that the initial benthic recolonization of dredged areas occurs relatively rapidly with reestablishment of all benthic community functions occurring at some later time.

5.12 If maintenance dredging should become necessary, the act of dredging in the harbor and its channels causes a certain amount of disruption to the normal harbor functions. The dredge, scows, tugs and tenders occupy physical space in the harbor and, in confined areas, may present something of a navigation hazard, or barrier, to free and normal use of the harbor.

BLASTING

5.13 Underwater blasting would have unavoidable adverse effects, including the destruction of benthic organisms and fish in the immediate vicinity of the explosion.

DISPOSAL

ON-LAND DISPOSAL

5.14 Burial of some vegetation on the selected disposal sites may occur. Adverse impacts can also be expected from rehandling and transporting dredged material. These include noise, harbor-area congestion, gas consumption, engine exhaust, and heavy truck traffic on the haul road.

5.15 With on-land disposal and utilization of dredged material for road repair and construction, temporary stockpiling of the sediments on the lake shore prior to its being hauled away would occur. The potential would exist that rain, meltwater or some other natural or human activity could carry possible contaminants back into the lake before removal of the sediment. However, it is anticipated that no long-term detrimental effects would be associated with the proposed temporary placement of dredged material on the shore.

CONSTRUCTION RESOURCE

5.16 Some leaching could occur during the temporary stockpiling of the sediments before they are hauled away to the construction site or at the construction site itself. Consequently, stipulations would be included which would control use of the material immediately in or adjacent to wetland areas, streams, rivers or lakes in order to prevent immediate runoff and leaching of contaminants back to public waters. If the dredged material were to be utilized as breakwater fill material, the potential for leaching of contaminants back to harbor waters would exist. However, this is not expected to occur to any significant extent.

6. ALTERNATIVES TO THE PROPOSED ACTION

NO ACTION

6.01 One alternative would be to not construct a harbor in either area. To do nothing would maintain the present situation along the North Shore of Lake Superior. Currently, due to the risks involved and other factors, only limited numbers of people presently boat for any distance along the North Shore even with Silver Bay harbor and Taconite harbor in place. Both of these harbors are large, have limited available quiet-water areas during storms, and lack any provisions for the casual recreational boater. To not build harbors near either Lutsen or Beaver Bay would not allow completion of a continuous system of harbors-of-refuge for small craft along the Great Lakes shore at intervals of 30 to 40 miles. There are presently 38 planned or existing commercial and recreational navigation harbors along the United States shoreline of Lake Superior. See exhibits 14, 15, 16, 17, pages A-20-A-26, for information concerning the location and type of installation at these harbor sites. This data was taken from the Great Lakes Basin Framework Study, Appendix 9, Volume 2, Recreational Boating. The information was updated for the St. Paul District harbors.

6.02 At present, there is a storm warning system serving the north shore of Lake Superior. The U.S. Coast Guard in Duluth utilizes a code with flags during the day to serve as an indicator of the weather. The Coast Guard also broadcasts the weather report every 3 hours in addition to giving a special alert whenever a storm necessitates such. While their broadcasts can only be picked up on a marine radio, which is not found in most small craft, a commercial station broadcasts the weather report which can be picked up on any AM-FM radio. There is no code with lights used in Duluth as a night storm warning system. The Coast Guard at Duluth feels their program is as effective as it can be, and that boaters generally heed their warnings. The system is probably more effective than it was during the preauthorization studies of the 1940's; however, the number of boaters exposed to the potential storm hazards has also increased. It has been noted in Wisconsin that there are many needless drownings every year because people do not pay attention to the extensive storm warning system in that State. Boaters would have to heed storm warnings to reach the

harbors-of-refuge if they were any distance out in the lake or along some of the stretches of shoreline.

6.03 There are those storms, however, which are so unexpected that no storm warnings can be given out in time. At these times a harbor-of-refuge would serve at least those boaters within a short distance from the harbor. With a no project alternative, the present storm warning system would continue to serve as the main safety provision for the Beaver Bay and Lutsen areas.

6.04 Lake Superior has long been renowned for its high quality sport fishing and its scenic beauty. Because of the attraction of the North Shore as a vacationing area and its great potential for further tourism, public interest in the North Shore runs high. Thus, any alternative chosen would be felt not only on the local level but on the State and national levels as well. However, since boating is only one dimension of the recreation offered along the North Shore the presence or lack of harbors-of-refuge at Beaver Bay and Lutsen does not necessarily represent a significant gain or loss to the tourist qualities of the Lake Superior North Shore.

ALTERNATE HARBOR-OF-REFUGE SITES

6.05 Since the authorized sites for Lutsen and Beaver Bay were no longer available due to extensive private developments following authorization, several alternate sites were investigated. The selections for the Lutsen and Beaver Bay harbor sites were based on economic feasibility, acceptability to the local people, and the closeness of the proposed alternate site to the respective authorized site and specifications.

ALTERNATE SITES - LUTSEN

6.06 Fifteen different sites were initially considered for the authorized Lutsen site. Exhibit 15, page A-27, indicates the locations of these alternate sites. The ensuing paragraphs describe the four sites most seriously considered for final selection.

6.07 The site approximately 2.6 miles northeast of the mouth of the Poplar River (site 6) is located on the north edge of Lutsen near the junction of Cook County Highway 4 and U.S. Highway 61. It consists of two small rock-rimmed coves separated by a small rock nose. The rock walls rise 10 to 15 feet above the water. Small gravel beaches have been formed in each of the two coves. The site is about 350 by 150 feet. The west side of the site is occupied by a cottage. The northeast cove is occupied by a small building and boat ramp with a year-round home and garage. The northwest shoreline is undeveloped and could be utilized for parking facilities. The development of this site into a harbor would require extensive breakwater construction to attain a desirable capacity. Ample parking and service areas are available. Boat launching would be

no problem. Some rock excavation and a breakwater would be required. This site is close to the original authorized Lutsen Harbor site at the Poplar River outlet and is situated midway between Grand Marais and Taconite Harbors. In addition to its desirable location, the site appears to be good for a small boat harbor due to favorable access and topographic conditions. The majority of study had been directed toward this site until further studies revealed that this site may not be feasible for breakwater construction due to its great water depth.

6.08 The Tofte site (site 11) would require a long breakwater, but little dredging would be necessary. Reports from a 1970 investigation indicate that the Tofte site has the advantage of relatively shallow water for breakwater construction. Structural features built within 40 to 50 feet of the shoreline and limited evidence of shoreline erosion suggest that wave action in the bay is never extremely severe. Also, the area has extensive tourist facilities which would provide a source of local support for the project. However, extensive private shoreline developments restrict access to this site and potential parking and service areas appear to be very limited.

6.09 The site just east of the Temperance River (site 13) consists of a fairly shallow bay. The area is presently undeveloped. The land around the bay is owned by the U.S. Forest Service; a State park adjoins the Forest Service land on the west.

6.10 The proposed site (site 15) at Schroeder, located just east of the Cross River, consists of a bay of adequate size with ample parking and service areas available. Access to the area would not be a problem as there is an existing gravel road with a turnabout situated between the mouth of the Cross River and the proposed harbor site. However, two rental cottages would have to be removed for construction purposes.

ALTERNATE SITES - BEAVER BAY

6.11 A bay adjacent to the southerly breakwater of Silver Bay has been the only seriously considered alternate site for the authorized Beaver Bay project. The site is well situated for favorable access, and ample area is available for parking and service facilities. An abandoned building is located on the east shoreline but poses no problem. The topographic considerations are favorable for the construction of a harbor. The site is close to the authorized location and close to the community with available facilities. While the surrounding land is owned by Reserve Mining Company, they have indicated a willingness to sell the land for the project. Finally, cost of construction is comparable to that at the authorized location.

6.12 The need for a harbor-of-refuge as currently evaluated would not be altered by using an alternative harbor location instead of the authorized project site. Variations in scope of the authorized project or use of an alternate location would have an effect upon the amount of small-craft use in the area. The numbers of locally-based and transient boats using the harbor would be dependent on the size of the harbor, wave sizes within the harbor, and other facilities provided. A harbor which would provide refuge during storms but only limited space for mooring would have limited effect upon the amount of recreational boating along the north shore.

The commercial harbor operated by Reserve Mining Co. is not generally open to the public except in the case of emergency. Small craft avoid the commercial harbor whenever possible because of the roughness of the large, exposed outer harbor, the potential dangers attendant upon the movement of large vessels, the absence of suitable moorings, and the likelihood of encountering oily and fouled water.

6.13 Another alternative would be to consider a new authorization to provide harbors-of-refuge at a spacing of approximately 15 miles instead of the 30 to 40 miles indicated in the project plan. The increased use of outboard motors for cruising and the rapid growth in recreational boating has created a demand for harbors-of-refuge at closer intervals. According to the Great Lakes Basin Framework Study, Appendix 9, Volume 2, Recreational Boating, much of the Great Lakes is not presently used by small craft because of the general lack of access to the Great Lakes waters and the hazards associated with open lake use. A highly used area of open waters does exist, however, offshore from each harbor on the Great Lakes. While more study is needed to determine the shape of this zone, judgment indicates it may be circular with a radius of approximately 5 miles. The majority of boats now operate within these areas. Comparative data indicates that offshore waters out to 10 miles would become effective if harbors were to be provided at intervals of 10 miles or less.

6.14 The increased use of outboard motors for cruising and for the rapid growth in recreational boating has created a demand for harbors-of-refuge at closer intervals. Refer to paragraph 1.33 for statistics of increased boating. Sport fishing, as a result of the introduction of coho salmon and the return of the lake trout, has further increased the demand for harbor facilities. Since harbor-of-refuge type facilities are essential for reasonably safe boating on Great Lakes waters, especially in offshore areas, it was assumed in the Great Lakes Study that additional harbors-of-refuge must be developed to reduce the maximum distance between them to not more than 13 miles.

6.15 In 1958, the Michigan State Waterways Commission, Department of Natural Resources inaugurated a program of 15-mile interval refuge harbors. By constructing such installations in or near large metropolitan centers, the program intends to encourage the use of the Great Lakes by larger numbers of recreational watercraft, which will stimulate interest in boating and could reduce some boating demand on inland waters.

DISPOSAL ALTERNATIVES

OPEN-LAKE

6.16 Open-lake disposal would bring the potentially detrimental materials associated with the sediments of the proposed harbors into intimate contact with the high quality water of the open lake. Such intimate contact between the contaminants and the Lake Superior water could result in a certain degree of water quality impairment as well as an adverse effect upon the aquatic ecosystem.

BEACH NOURISHMENT

6.17 From the point of view of wise resource utilization, beach nourishment would be a good method of using the sand, gravel and stone dredged from the harbor. However, this method of disposal could introduce potentially detrimental materials contained in the sediments to the inshore waters and to the open lake through redistribution of the sediment by waves and longshore currents.

CONSTRUCTION RESOURCE

6.18 Use of the sand, gravel and stone dredged from the harbors as material for road construction and repair, while allowing some leaching, represents a constructive disposal method. Stipulations should be included which would control use of the material immediately in or adjacent to wetland areas, streams, rivers or lakes in order to prevent immediate runoff and leaching of contaminants back to public waters. Utilization of the dredge material as fill material in the breakwaters would also represent a constructive disposal method. This would be feasible, however, only if the rocks were of the correct gradation, and not of a too "polluted" nature.

ON-LAND DISPOSAL

6.19 On-land or confined disposal of dredged material is the usual recommended disposal alternative for cases of polluted sediment. However, it is not always economically feasible, particularly when the amounts of polluted sediments involved are small. It is currently proposed that on-land disposal be the selected disposal alternative at the Schroeder site. The material would be placed in an area adjacent to the haul road and leading to the Carlton Peak quarry site (exhibit 4). At Silver Bay, excavated material could be placed in an area west of the harbor site (exhibit 5).

7. RELATIONSHIP BETWEEN SHORT-TERM USES OF NATURAL ENVIRONMENT
AND MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

7.01 The propriety of Corps of Engineers construction and maintenance activities in the proposed harbors-of-refuge at Silver Bay and Schroeder must be weighed against the potential damage incurred to man's life support system - the biosphere - thereby guarding against the short sighted foreclosure of future options or needs. Past, present and proposed actions and their associated detrimental and beneficial impacts must be considered not only in relation to the specific harbor area affected but also to the greater area and public served by the project. To measure the short-term uses of the project against the long-term productivity of the project is essentially an energy measurement.

7.02 To build and maintain the breakwaters would require a fixed amount of irreplaceable energy. The project-induced benefits would result in additional expenditures of energy by boaters and other recreationalists. It is likely that the net energy balance would be negative with the project but only detailed studies could verify or refute this contention.

7.03 Constructing and maintaining the harbor would require some localized long- and short-term expenditures of funds, manpower, and natural resources. Localized disruptions of the benthic biological community would also occur. Future maintenance dredging and structure repair should not constitute a very significant long-term detrimental effect upon life styles, land use patterns or ecosystems in the Silver Bay and Schroeder harbor areas.

8. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

8.01 If the proposed projects are constructed, an irretrievable and irreversible commitment of resources would be necessary.

8.02 Approximately 0.5 acre of lake bottom for the proposed Beaver Bay project and 3 acres of lake bottom for the proposed Lutsen project would be covered by the breakwater. Additional land covered would include 0.05 acre at Silver Bay and approximately .10 acre of land at Schroeder where the breakwaters would originate.

8.03 Construction materials, hydrocarbon fuels and human resources utilized for construction of the proposed projects are all resources which would be irretrievably committed if the projects were constructed. Depreciation of construction equipment used must also be considered.

8.04 If secondary development occurs, further utilization of land, construction materials, hydrocarbon fuels, and human resources would result.

9. COORDINATION

9.01 The authorized plans for the proposed Beaver Bay and Lutsen harbor-of-refuge projects were outlined for the Cook and Lake County Boards, respectively, in letters dated 25 February 1960. The letters specified the requirements of local cooperation and inquired as to the need and desirability for the projects. A letter, dated 5 April 1960, from the Cook County auditor indicated a lack of local interest in the Lutsen harbor project, and the project was placed in an inactive status. The Lake County Board, in a letter dated 14 March 1960, stated they were not legally or financially able to comply with the provisions for local cooperation but had instead referred the question to the mayor of Beaver Bay. In two letters, dated 28 March and 16 April 1970, the mayor replied that Beaver Bay was not able to comply with local requirements, and the project was consequently placed in an inactive status.

9.02 The village of Silver Bay showed renewed interest in the Beaver Bay project in a letter dated 24 September 1969; and in a letter dated 17 November 1969, the village of Silver Bay transmitted a resolution from the village council stating their interest in constructing a harbor at Silver Bay and assuring their participation as local sponsor. However, as funds were not available to proceed, the project remained in an inactive status. Renewed interest in the Lutsen project was shown by the Cook County Board of Commissioners when a resolution assuring local cooperation was adopted on 18 December 1969, and furnished to the St. Paul District in a letter dated 19 December 1969.

9.03 Due to private developments which had occurred at the authorized Lutsen site, District personnel conducted an investigation and field inspection for possible alternative sites on 27 August 1973. A letter, inclosing a tabulation of 13 alternative sites, was sent to the Cook County Board on 20 September 1973 advising them of the pending initiation of preconstruction planning for a harbor near Lutsen.

9.04 In a letter dated 12 October 1973, the chairman of the Cook County Board indicated concern that the county could not provide the local cooperation on the project. This inability to meet the non-Federal cooperation requirements was again confirmed on 29 October 1973 when District representatives met with the County Board. However, in a letter dated 2 November 1973, the Cook County Board expressed continued interest in the project and requested continuation of a feasibility study.

9.05 Meanwhile the village of Silver Bay, in a 21 February 1973 letter, requested advisement of the present status of their project and were informed of the availability of funds to initiate planning in fiscal year 1974.

9.06 Correspondence concerning the two projects was sent to the State of Minnesota on 7 November and 18 December 1973 and 10 January 1974. By letter dated 28 February 1974, the State responded that they are authorized to fund one-half the eligible local share of the cash contribution for the harbors-of-refuge at Lutsen and Beaver Bay. The funds would be for facilities directly related to safety but could not exceed \$100,000. Maintenance and operation costs remain the sponsor's responsibility.

9.07 To date, two public meetings have been held in Lutsen, and one in Silver Bay. From the start in Silver Bay, local citizen committees, through the city council and county board, have actively promoted the project. Coordination has been executed by letter correspondence, telephone and one meeting with members of the City Park Board and the City Attorney.

9.08 As of 1 January 1975, two public meetings had been held in Lutsen concerning the Lutsen harbor-of-refuge project. Since then, the Cook County Board of Commissioners has met several times concerning the final selection of an alternate location to the authorized Lutsen site. Corps representatives were present at the 18 June 1975 and 11 September 1975 county board meetings. The Schroeder site was chosen at the September meeting. Further meetings between the Corps and the sponsoring cities of Schroeder and Silver Bay to discuss recreational development of the proposed harbors have been held. (See exhibit 19).

9.09 Copies of the draft environmental impact statement were furnished to the following agencies, citizen groups and individuals for comment:

- Environmental Protection Agency
- U.S. Department of Agriculture
- U.S. Department of Commerce
- U.S. Department of Health, Education, and Welfare
- U.S. Department of Housing and Urban Development
- U.S. Department of the Interior
- U.S. Department of Transportation
- Advisory Council on Historic Preservation
- Minnesota-Wisconsin Boundary Commission
- Minnesota Department of Agriculture
- Minnesota Department of Economic Development
- Minnesota Department of Health
- Minnesota Department of Natural Resources
- Minnesota Environmental Quality Council
- Minnesota Highway Department
- Minnesota Historical Society
- Minnesota Pollution Control Agency
- Minnesota Resource Commission

Minnesota State Archaeologist
 Minnesota State Park Commission
 Minnesota State Planning Agency
 Minnesota Water Resources Board
 Mayor, Beaver Bay
 Mayor, Lutsen
 Mayor, Silver Bay
 Great Lakes Basin Commission
 Upper Great Lakes Regional Commission
 Arrowhead Regional Development Commission
 Citizens Advisory Committee, Environmental Quality Council,
 St. Paul
 Ducks Unlimited, Minneapolis
 Friends of the Earth, Minnesota Branch
 Izaak Walton League of America, Minnesota Division
 Minnesota Environmental Control Citizens Association,
 Minneapolis
 Minnesota Public Interest Research Group, Minneapolis
 National Audubon Society, North Midwest Representative
 Northern Environmental Council, Duluth
 Sierra Club North Star Chapter
 Soil Conservation Society of America, Minnesota Chapter
 Minnesota Educational Association, Environmental Task Force
 Minnesota Environmental Steering Committee, Minnesota Department
 of Education
 Lake County Planning and Zoning Commission, Two Harbors, Minnesota
 Lake County Auditor, Two Harbors
 Minnesota Environmental, Education and Research Association,
 St. Paul
 Minnesota Environmental Education Council
 Great Lakes Fleet, Duluth
 Minnesota Arrowhead Association
 Water Quality Management Planning Team, Duluth
 Lake Superior, North Shore Association, Grand Marais
 Minnesota Conservation Federation
 The Nature Conservancy, Minnesota Chapter, Lake County Planning
 and Advisory Commission

9.09 Comments were received from the following:

U.S. Environmental Protection Agency
 U.S. Department of Agriculture
 U.S. Department of Commerce
 U.S. Department of Housing and Urban Development
 U.S. Department of Health, Education and Welfare
 U.S. Department of the Interior
 U.S. Department of Transportation
 Minnesota Department of Natural Resources
 Minnesota Historical Society
 Minnesota Pollution Control Agency

State of Minnesota, Environmental Quality Council
City of Silver Bay
Planning and Zoning Office, County of Lake, Two Harbors
Advisory Council on Historic Preservation

9.10 Copies of the letters of comment with the Corps responses follow.

**LETTERS of COMMENT
and
CORPS RESPONSES**



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION V
330 SOUTH DEARBORN STREET
CHICAGO, ILLINOIS 60604

Colonel Max W. Noah

District Engineer
U. S. Army Engineer District, St. Paul
1210 U. S. Post Office & Customhouse
St. Paul, Minnesota 55101

MAR 3 1975

Dear Colonel Noah:

In response to your letter of December 30, 1974, we have completed our review of the Draft Environmental Impact Statement (EIS) for the Construction of Harbors - of - Refuge at Lutsen and Beaver Bay, Minnesota. We have classified our comments as Category ER-2. Specifically, this means we have environmental reservations about the projects with regard to the effects of dredge spoil disposal on water quality and we believe more information should be provided in the EIS about the chemical constituents of the bottom sediments. The classification and date of our comments will be published in the Federal Register in accordance with our responsibility to inform the public of our views on major federal actions having significant impacts on the environment. We offer the following comments for inclusion in the Final EIS.

According to the EIS, there has been no sediment sampling done by EPA or others at the proposed harbor sites. Until studies are completed to determine the classification of the bottom sediments, we must express environmental reservations concerning dredging and disposal. We suggest you contact Mr. David Kraus (312-353-5826), Great Lakes Surveillance Branch, for details concerning coordination, scheduling, and sampling at the proposed harbors.

Other harbors of refuge such as the Knife River Harbor have been subjected to secondary development. Secondary or indirect impacts induced by harbor construction should be addressed in the EIS. The adequacy of local zoning ordinances to regulate future land use near the harbors to insure compatible development should be described.

The EIS should discuss the consideration given to utilizing any suitable dredge material as fill material in the breakwater.

The effects of harbor construction on shoreline erosion should be discussed in detail. The relationship of breakwater location and littoral currents should be described. Areas expected to be subject to erosion, accretion and shoaling should be indicated.

Corps responses to U.S. ENVIRONMENTAL PROTECTION AGENCY

1. Mr. David Kraus has been contacted regarding coordination, scheduling, and sampling at the proposed harbors. Sediment analysis has been completed at Lutsen (Schroeder) and Beaver Bay (Silver Bay). See paragraphs 1.24 to 1.30, 2.26 and 2.27 of the final EIS for a discussion.
2. Mention of the impacts of the secondary development has been expanded in the final EIS. See paragraphs 4.62 to 4.63. It should also be noted that minimal recreational facilities may be constructed at both harbors as described in paragraph 1.20. Local zoning ordinances are discussed in section 3. The types of induced development and resultant impacts cannot be accurately determined at this time. The limitations of zoning as a land-use control are recognized.
3. Concur. See paragraphs 1.24 to 1.29, 4.56, 5.16, and 6.18.
4. Concur. See paragraph 4.03, final EIS, for discussion.

5. Mitigative measures taken by the Corps to minimize water quality degradation due to the spillage of oil and other pollutants during Corps harbor activities have been included in paragraph 4.38. The present strategy is to prevent spillage rather than to clean up spills.

Specific plans should be developed prior to construction to contain and remove any spillage of oils or other pollutants while working in or around the lake. These plans should include equipment on board dredging vessels to contain and remove visible oils or fuels on the lake surface.

Thank you for providing us with the opportunity to comment on the EIS. Please provide us with four copies of the Final EIS when it is filed with the Council on Environmental Quality.

Sincerely yours,

Donald A. Wallgren

Donald A. Wallgren
Chief,
Federal Activities Branch



UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
Eastern Region

633 West Wisconsin Avenue, Milwaukee, WI 53203



8420

February 26, 1975

Colonel Max W. Noah
District Engineer
St. Paul District, Corps of Engineers
1210 U.S. Post Office & Custom House
St. Paul, Minnesota 55101

Dear Colonel Noah:

Reference is made to your letter of December 30, 1974, asking us to comment on the draft Environmental Impact Statement for Harbors-of-Refuge at Lutsen and Beaver Bay, Minnesota, Lake Superior.

We hope the attached comments from our field people will be helpful, and we apologize for the late reply.

Thank you for the opportunity to review. We will look forward to receiving the final statement.

Sincerely,

W. N. Cravens
W. N. CRAVENS
Regional Forester

Enclosure

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE

Superior National Forest
P.O. Box 338, Duluth, MN 55801

February 20, 1975

REPLY TO 8420 Other Agencies Environmental Statements

SUMMARY Corps of Engineers EIS - Harbors of Refuge
for Beaver Bay and Lutsen

TO Regional Forester, R-9



Following are our comments on the Corps of Engineers Draft EIS on proposed harbors of refuge on Lake Superior at Lutsen and Beaver Bay. Comments are keyed to the numbered sections in the subject document.

General - The proposed harbors of refuge will not directly affect any lands of the Superior National Forest, or any of its programs. The Forest Service has no objections to the harbors of refuge program. Our comments are directed at the content and organization of the EIS in the hope that they will be a constructive contribution to the final statement.

1.17 and 1.18, Economics - For a cost of over 3 million dollars, the EIS should include more cost/benefit data. Other than providing additional components of the harbors-of-refuge system approved in 1944-45, the proposal does not demonstrate any need for these facilities. The need, as set forth in House Document 466-78-2, should be summarized for the benefit of the reviewer. Recent increases in recreational boating on the Great Lakes have been documented and should be at least addressed. The Great Lakes Basin Commission Framework Study Appendix 9 (Navigation - Commercial and Recreational), the Bureau of Outdoor Recreation, the U.S. Coast Guard and organized Great Lakes cruising clubs are all potential sources of this information. Given this data and information from areas such as the lower lakes where harbor development and increases in boating have already occurred, some positive assessment of the need for this project could be developed. The Michigan State University Agricultural Experiment Station's Research Report No. 175, "Public Marinas Impact on Local Employment" should also be a useful reference.

Corps responses to U.S. DEPARTMENT OF AGRICULTURE

6. Under the original authorization for harbors-of-refuge (House Document 445-78-2), it is stated that a number of the proposed harbors "are located in undeveloped sections where the cost of improvement cannot be justified by benefits to present or prospective local commerce. Justification for improvements of those harbors must therefore rest upon general benefits arising from utilizing the harbors as links in the general plan." "The establishment of harbors-of-refuge on Lake Superior should be judged on its relation to the entire system along the American shore of the lake. The problem to be considered and solved differs from that involved in deciding as to the advisability of creating a new harbor. . . whose principal use would be confined to recreational or commercial vessels based at that port. To consider any particular harbor without reference to the whole system would not serve the purpose that Congress had in mind when passing the legislation to which this report is a response." "Since all of the harbors recommended cannot be justified solely and entirely upon present local and transient traffic at each individual locality, their ultimate construction should be based upon the need for a chain of harbors-of-refuge on Lake Superior and upon the intangible benefits to the area as a whole from the stimulation of the use of small recreational craft." Benefits from the project at Beaver Bay and Lutsen are not subject to firm monetary evaluation, nor are benefit-cost analyses applicable in accordance with the project document. As a consequence, no known economic evaluation of benefits has been made for any harbors-of-refuge constructed under this authority. The principal direct benefits to be derived from construction of the small-craft harbors, according to House Document 446-78-2, are increased safety to citizens and their property, including commercial fishermen as well as owners of light-draft recreational craft, the development of the small-boat building industry and attendant services; and stimulation of the resort business, which is large and growing. The relatively large tourist and resort industry in the area tributary to Lake Superior is a direct result of the drawing power of the lake itself. Consequently, harbors-of-refuge should increase the desirability of the contiguous shore for resort and summer communities. See paragraph 1.33 for increased use by small boats.

Corps responses to U.S. DEPARTMENT OF AGRICULTURE (Continued)

The intangible benefits include those resulting from the increased facility of healthful recreation that would be made available to the general public. Lutsen and Beaver Bay are two of the last three links in the harbor-of-refuge system along the North Shore of Lake Superior. We recognize the fact that not all of the above mentioned benefits are indicative of any one harbor in particular; but are rather a result of the continuous system of harbors-of-refuge utilized as a whole; for example, no significant economic impacts are expected to occur in the Silver Bay and Lutsen areas with construction of the two respective harbors.

While the proposed harbors do not appear to serve any purpose other than providing additional components to the harbors-of-refuge system, it must be remembered that proposed harbors were authorized on this single function, and our proposal should be judged accordingly. The Lake Superior region is a desirable recreational area but has remained largely undeveloped partly because of the lack of accommodations for light-draft vessels, which renders their use hazardous at many localities.

The need, as set forth in House Document 446-78-2, was to provide a continuous system of harbors-of-refuge for small craft along the Great Lakes shore at intervals of 30 to 40 miles. Paragraphs 1.71, 1.32 to 1.35, 2.05, 2.82 and 2.83 in the final EIS contain data from the project documents concerning the necessity for harbors-of-refuge on Lake Superior.

2.64. Future Environment Without the Project - This should be included in the cost/benefit analysis suggested in section 1. The "with project" vs. "without project" comparison should show the net benefits that will accrue from the investment of 3 million dollars.

2. Water Quality - It is not clear what effect the Reserve Mining Co. discharges would have on these harbors, or vice versa. Is this data relevant?

2.22, 4.37 - Research has been done on the environmental effects of pleasure on lakes. Some estimate of future use, plus comparisons with existing marinas and harbors on Lake Superior should help in determining whether or not the pollution load can be anticipated to be significant. Some indication of the magnitude of the impacts is needed.

2.49, 4.08 - Reference should be made to the current move to remove the timber wolf in Minnesota from the endangered species list. Further, we question the significance of these two sites (particularly the site adjacent to Reserve Mining Co.) in the territories of the wolf packs. Both sites are in already somewhat built-up areas, and the wolves tend to use the area near the lake mostly in winter, when harbor activity is nil. Consultation with the Fish and Wildlife Service and the MNHR would be in order.

4.19-4.23, Aesthetics - Has consideration been given to mitigating adverse visual impacts of developments, e.g. possible screening of developments from roadside viewing with vegetation? Another consideration is the surrounding area. A long breakwater adjacent to an industrial complex should be less objectionable than the same breakwater installed in an undeveloped stretch of shore.

4.38, 5.06, Congestion - This would be a consideration in a harbor with competing use. Is it relevant when dredging a new facility with no concurrent vessel traffic?

Sections 4 and 5 - The discussion of the effects of dredging leaves the reader unfamiliar with dredging at a loss to evaluate the expected impact of these two small projects. One suspects it should be minor, but the magnitude is difficult to determine.

In discussing probable impacts, induced secondary developments (access roads, boat ramps, toilets, parking, etc.) which are likely should be reviewed. Who is to provide and maintain these facilities? An assessment of the long-term environmental effects of these developments and of harbor use (boat exhaust, fuel spillage, waste disposal etc.) should also be made to present a complete picture.

Corps responses to U.S. DEPARTMENT OF AGRICULTURE (Continued)

7. See paragraph 1.3) and the previous response.

8. While it is not clear what effect the Reserve Mining Co. discharges would have on these harbors, the possibility exists that there could be factors attributed to these discharges. Consequently, the taxonomic findings data is relevant. Further discussion of this was also requested by the U.S. Department of the Interior (Response number 27).

9. This information has been included (see paragraphs 2.24 and 4.62 to 4.65).

10. Reference to this information has been included in this statement; see paragraphs 2.56 and 4.08.

11. We concur with the need to mitigate any adverse visual impacts. Adverse visual impacts are not necessarily generated with construction of a breakwater. Consideration has been given, however, to mitigating any adverse visual impacts of the developments. Refer to paragraphs 4.21 to 4.23.

12. Concur. Paragraphs 4.38 and 5.08 have been omitted. Congestion is now discussed under operation and maintenance impacts, sections 4 and 5.

13. The impacts of dredging are discussed in sections 4 and 5. Since the degree of impact of dredging is related to the amount of dredging necessary and since the amounts to be dredged initially in both harbors are small the impacts should not be highly damaging. Blasting is probably of more concern. Little maintenance dredging is expected to be necessary (see paragraphs 1.23 and 4.82).

14. As noted in response number 2, to the U.S. EPA, the discussion of the impacts of secondary development has been expanded in the final FIS. (See paragraphs 4.62 to 4.75.) The responsibility of the Corps in operation and maintenance is noted in paragraph 1.21. Also see response number 37 (Minnesota Pollution Control Agency). Local interests would be responsible for provision and maintenance of ancillary facilities.

15. The EPA pollution study for sediments referred to is necessary information for any realistic assessment of dredging and disposal alternatives. This should definitely be done prior to development of the final EIS and included in that document.

16. Alternatives - The discussion of alternatives does not present a full discussion of the advantages, disadvantages, costs and benefits of the various possible locations and of alternative sediment disposal methods. This section should be developed more fully in the final EIS, with particular attention to the rationale for choosing the selected sites. Reference to other documents (e.g. House Document 446) is not adequate for short review periods.

17. Coordination - Here or in the introduction, a summary of planned and existing developments for the entire lake, including sections under the jurisdiction of the Detroit District of the Corps and the Ontario Ministry of Natural Resources would be helpful.

Robert J. Miller
Robert J. Miller
Acting Forest Supervisor

Corps responses to U.S. DEPARTMENT OF AGRICULTURE (Continued)

15. Concur. A more complete discussion of dredging and disposal alternatives has been included. See paragraphs 1.24 to 1.30, 2.26 and 2.27 of the final EIS for discussion.

16. Concur. A more complete discussion of alternatives has been included in section 6.

17. A summary of planned or existing harbors along the United States shorelines of Lake Superior has been included in the Appendix (see exhibit 14). Information on non-United States harbors was not readily available.



UNITED STATES DEPARTMENT OF COMMERCE
The Assistant Secretary for Science and Technology
Washington, DC 20230

February 24, 1975

Colonel Max W. Noah
District Engineer - St. Paul District
Corps of Engineers
U. S. Department of the Army
1210 U. S. Post Office & Custom House
St. Paul, Minnesota 55101

Dear Colonel Noah:

The draft environmental impact statement "Lake Superior, Harbors of Refuge at Lutsen and Beaver Bay, Cook and Lake Counties, Minnesota," which accompanied your letter of December 30, 1974, has been received by the Department of Commerce for review and comment.

The statement has been reviewed and the following comments are offered for your consideration.

GENERAL COMMENTS

Geodetic control survey monuments are located along Highway 61 which closely parallels the shoreline at both Silver Bay and Lutsen. If there is any planned activity which will disturb or destroy these monuments, the Department of Commerce, National Ocean Survey of which the National Geodetic Survey is a part, requires not less than 90 days notification in advance of such activity in order to plan for their relocation. This Department also recommends that funding for this project include the cost of any relocation required for these monuments. We request that this advance notification be given to: Director, National Geodetic Survey, NOS, NOAA, U. S. Department of Commerce, Room 304A, WSC #1, 6010 Executive Blvd., Rockville, Maryland 20952.

There are no water level stations in the areas involved in these proposed projects.

Corps responses to U.S. DEPARTMENT OF COMMERCE

18. No current plans would affect these monuments. In the event any change in this status should occur notification and coordination would be accomplished.



SPECIFIC COMMENTS

1.0 PROJECT DESCRIPTION

1.17 ECONOMICS

While the explanation of the costs estimates for the two harbors-of-refuge is adequate, it is necessary to compute the cost figures for these harbors using the current discount rate pursuant to Water Resource Council Regulations.

3.0 RELATIONSHIP OF THE PROPOSED ACTION TO FUTURE LAND USE

The following language is suggested for the description of the Coastal Zone Management Plan in paragraph 3.01:

"The purpose of this management plan is to make an appraisal investigation and study, including a review of any previous relevant studies and reports of the coastal zone and to develop recommendations for the management of lands, the use of which have a direct and significant impact on the coastal waters."

4 PROBABLE IMPACTS OF THE PROPOSED ACTION ON THE ENVIRONMENT

GENERAL

Of the two proposed small craft harbors of refuge, the Beaver Bay Harbor will have practically no effect on nearshore water circulation and littoral drift. Lutsen Harbor, by extending into Lake Superior 400 feet, will cause minor effect on lake water movement; however, it will stop littoral movement, if one exists. Judging from information available in the statement, littoral drift should be well and consist mostly of gravel. Dredging and disposal in Lake Superior of coarse material should cause no lasting effects.

19. Reference is made to paragraph 1.31. According to the Water Resource Council regulations on discount rates, an interest rate of 3 1/4 percent may be used for computing Federal and non-Federal annual charges for projects for which appropriate non-Federal agencies have given by 31 December 1969 "satisfactory assurances to pay the required non-Federal share of project costs." The Board of Commissioners of Cook County passed a resolution, 18 December 1969, furnishing the necessary assurances for the authorized Lutsen Harbor while the Village Council of Silver Bay passed a resolution furnishing the necessary assurances for the proposed Beaver Bay harbor-of-refuge project on 3 November 1969. Consequently, it is not necessary to compute the cost figures for these harbors using the current discount rate pursuant to Water Resource Council Regulation.
20. The paragraph has been revised.
21. Concur. See paragraph 4.03. The proposed method of disposal now includes utilization of excavated rock material from the Silver Bay site for shore protection purposes and utilization of excavated material from Schroeder as land fill in the adjacent shore area. Excess and unsuitable material would be deposited in proposed on-land disposal sites. See paragraphs 1.24 to 1.30. All disposal plans will continue to be closely coordinated with appropriate Federal and State agencies.

-3-

4.64 BREAKWATER MAINTENANCE

Breakwaters will require frequent and extensive maintenance. Ice formation at this Lake Superior shoreline is very heavy and has a tendency to move. Lake Superior waves caused by storms from the northeast are the highest of all Great Lakes waves. Significant waves have been recorded to reach 23-foot height. Lake bottom configuration in front of the harbors will modify the high waves and reduce their height before reaching the harbor structures. The extreme storms can be expected during early spring or fall.

22.

Thank you for giving us an opportunity to provide these comments, which we hope will be of assistance to you. We would appreciate receiving a copy of the final statement.

Sincerely,

Henry R. Geller
Sidney R. Geller
Deputy Assistant Secretary
for Environmental Affairs

22. Concur. This information has been added to the breakwater maintenance section of the EIS (paragraph 4.79).



DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
MINNEAPOLIS-ST. PAUL AREA OFFICE
GRIGGS-MIDWAY BUILDING, 1821 UNIVERSITY AVENUE
ST. PAUL, MINNESOTA 55104

FEB 20 1975

MEMORANDUM FOR
Mr. [Name] [Title]
Chicago, Illinois 60606

IN REPLY REFER TO:

5.6860

CORPS RESPONSES TO U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

23. While the harbors would be used as home ports for recreational craft of residents in the area, the proposed harbors were authorized as two of a chain of harbors-of-refuge on the Great Lakes for light-draft vessels. The justification for the two harbors should accordingly be based upon general benefits arising from utilizing the harbors as links in this general plan. See paragraphs 1.01, 1.31-1.35, 2.03, 2.82 and 2.83 in the EIS and response number 6 (U.S. Department of Agriculture).
24. These paragraphs have been expanded (see paragraphs 1.10, 1.13 and 1.14).

Max W. Noth, District Engineer
St. Paul District, Corps of Engineers
1210 U.S. Post Office & Custom House
St. Paul, Minnesota 55101

Dear Mr. Noth:

Subject: Review of Draft EIS
Harbors-of-Refuge at
Lutsen and Beaver Bay
Minnesota, Lake Superior

We concur that the proposed Harbors-of-Refuge at Lutsen and Beaver Bay would create safe harbors for light draft recreational and commercial fishing vessels during periods of storms on the north shore of Lake Superior. However, we believe that the use of such facilities will be as home ports for recreational craft of residents in the area. Section 4.60 of the Draft EIS bears this out and further raises the question of whether enough people would utilize the harbors to justify their existence. We would suggest that consideration be given to discussing more fully this aspect of the proposed project.

Similarly in Sections 1.08 and 1.09, we feel a very limited explanation is given for breakwater placement and the type of breakwater construction chosen. We would suggest consideration be given to expanding the discussion of these aspects of the project. Such explanation appears to be needed for more clearly understanding the effect of the breakwaters on the environment and vice versa.

We are pleased to be offered the opportunity to comment on this draft environmental impact statement.

Sincerely,

W. J. Hastings
W. J. Hastings
Acting Area Director

ACTING

23.

24.



DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

REGION V
300 NORTH WACKER DRIVE
CHICAGO, ILLINOIS 60606

OFFICE OF
THE REGIONAL DIRECTOR

January 20, 1975

Mr. Max W. Noah
Colonel, Corps of Engineers
District Engineer
Department of the Army
1210 U.S. Post Office and Custom House
St. Paul, Minnesota 55101

Dear Mr. Noah:

RE: Draft Environmental Impact Statement
Harbors of Refuge at Lutsen and Beaver Bay
Lake Superior
Cook and Lake Counties, Minnesota

We have reviewed the Draft Environmental Impact Statement for the above project. To our knowledge, and based upon the information provided, this project will not impact to any significant degree on the health, education or welfare of the population.

Sincerely yours,

Robert A. Ford
Robert A. Ford
Regional Environmental Officer

cc: Charles Custard, ORA
Warren Muir, CBQ



United States Department of the Interior

OFFICE OF THE SECRETARY
NORTH CENTRAL REGION
210 S. DEARBORN STREET, 12th FLOOR
CHICAGO, ILLINOIS 60604

(ER-75/7)

February 11, 1975

Colonel Max W. Noah
District Engineer
U.S. Army Engineer District
St. Paul
1210 U.S. Post Office & Custom House
St. Paul, Minnesota 55101

Dear Colonel Noah:

The Department of the Interior has reviewed the Draft Environmental Statement for the Lake Superior Harbors of Refuge at Lutsen and Beaver Bay, Cook and Lake Counties, Minnesota as requested in your transmittal letter of December 30, 1974, to our Assistant Secretary, Program Policy. Our comments relate to areas of our jurisdiction and expertise and have been prepared in accordance with the National Environmental Policy Act of 1969.

The statement does not consider adequately dredge disposal alternatives for the proposed harbors. Since the Environmental Protection Agency has not yet classified the proposed harbor sites as either "polluted" or "non-polluted," the intended alternative for dredge disposal is open-lake dumping (or possibly beach nourishment). Yet, the possibility exists that at least the recommended area for the Beaver Bay facility could be polluted; and as such, alternatives for on-land disposal sites should be discussed for both harbors.

In the event that either or both of the proposed harbor areas are classified "polluted" and open-lake disposal must be rejected after the final statement is released, we suggest that an appendix or a separate environmental assessment be prepared to discuss the alternative disposal sites.

The environmental impact statement also indicates on page 10 that tailings are deposited over the bottom in much of the western part of Lake Superior. If so, construction of the harbors may stir up and resuspend tailings that have already settled. The statement should address itself to such a possibility and discuss the effects should that occur.

Corps responses to U.S. DEPARTMENT OF THE INTERIOR

25. Concur. The discussion of alternative dredge disposal methods has been expanded. See paragraphs 4.54-4.61 and 5.14-5.16 and 6.16-6.19. It should be noted that the proposed disposal plan has been altered. See paragraphs 1.24-1.30.
26. Disposal sites have been proposed and are discussed in this final EIS; see paragraphs 1.24-1.30. Should a disposal site not discussed in the EIS be selected, a supplement to this impact statement would be prepared if necessary.
27. Concur. This discussion has been added; see paragraph 4.37.



Known mineral resources of the two harbor areas are limited to sand, gravel, and stone. Nickel and other sulfides may occur in the area in uneconomic concentrations. The environmental impact statement does not mention mineral resources. Because the harbors would be constructed in offshore areas of Lake Superior, we believe that they would not alter the availability of mineral resources in the area. However, because the Beaver Bay Harbor would be adjacent to the Reserve Mining Company's harbor, it may be that boat congestion could interfere with the movement of iron ore (taconite pellets) from the company's harbor. The impact statement should explain whether such a problem may arise and, if pertinent, discuss plans for correcting it.

Sincerely yours,

David F. Jensen
for Madonna F. McGrath
Acting Special Assistant
to the Secretary

Corps responses to U.S. DEPARTMENT OF THE INTERIOR (Continued)

28. A discussion of mineral resources had been included in paragraphs 2.08. Possible boat congestion has been discussed in paragraphs 4.29 and 4.62.



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Federal Building, Fort Snelling
Twin Cities, Minnesota 55111

IN REPLY, REFER TO

ES-FWP

FEB 9 1975

Colonel Max W. Noah
District Engineer
U.S. Army Engineer District
St. Paul
1210 U.S. Post Office & Custom House
St. Paul, Minnesota 55101

Dear Colonel Noah:

This letter provides further comments regarding the proposed harbors of refuge at Beaver Bay and Lutsen, Lake and Cook Counties, Minnesota.

We understand that you intend to conduct open-lake disposal of materials dredged from the harbor sites. Because the Environmental Protection Agency (EPA) has not yet classified the pollutional status of either harbor, this alternative apparently is legally feasible. However, since the possibility exists that at least one of the harbors may be polluted, we are opposed to the alternative of open-lake disposal of dredged materials from these proposed harbors. We will maintain this position until the harbors are classified by EPA and agreeable disposal methods are determined.

Sincerely yours,

[Signature]

ACT-5 Regional Director

cc: Regional Administrator, EPA, Chicago



Save Energy and You Serve America!

Corps responses to U.S. DEPARTMENT OF THE INTERIOR FISH AND WILDLIFE SERVICE

29. Open-lake disposal has been eliminated as one of the dredge material disposal methods. The discussion on the disposal method can be found in the final EIS in paragraphs 1.24-1.30.



**DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD**

Address reply to
COMMANDER
Ninth Coast Guard District (nep)
1240 East 9th St.
Cleveland, Ohio 44199
Phone: 216-522-3919
5922
14 February 1975

Department of the Army
St. Paul District, Corps of Engineers
1210 U. S. Post Office & Custom House
St. Paul, Minnesota 55101

Re: NCSD-ER; Draft Environmental Impact
Statement, Lake Superior Harbors of
Refuge at Lutsen and Beaver Bay

Dear Sir:

The referenced Draft Environmental Impact Statement has been reviewed
by this office and at this time we have no comments to offer.

Sincerely,

W. C. OCHMAN
Captain, U. S. Coast Guard
Chief, Marine Safety Division
By direction of the Commander,
Ninth Coast Guard District

Copy to:
COMPT (G-422)



U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
REGION 5
18209 DINIE HIGHWAY
HOMERWOOD, ILLINOIS 60430
January 13, 1975

IN REPLY REFER TO
05-00.5

Colonel Max W. Noah
District Engineer
St. Paul District, Corps of Engineers
1210 U.S. Post Office & Custom House
St. Paul, Minnesota 55101

Dear Colonel Noah:

As requested, we have reviewed the draft environmental statements for the Operation and Maintenance, Marquette and Presque Isle Harbors, Marquette, Michigan; and Harbors-of-Refuge at Lutsan and Beaver Bay, Minnesota.

The proposed actions do not affect existing highways nor will future highways affect or be affected by the Corps action.

The opportunity to review and comment on the draft environmental statements is appreciated.

Sincerely yours,

H. L. Anderson
Regional Administrator

By: /

W. G. Ewrich, Director
Office of Environment and Design

STATE OF
MINNESOTA
DEPARTMENT OF NATURAL RESOURCES
CENTENNIAL OFFICE BUILDING - ST. PAUL, MINNESOTA - 55155
164J

February 14, 1975

Colonel Max W. Noah
District Engineer
St. Paul District
Corps of Engineers
1210 U. S. Post Office and Custom House
St. Paul, Minnesota 55101

net NCSD-44

Dear Colonel Noah:

The Department of Natural Resources has reviewed the draft Environmental Impact Statement on Harbors of Refuge at Lutsen and Beaver Bay, and offers the following comments.

We see no major problems with either site as proposed, however we would suggest the alternate site to the Beaver Bay site, at Silver Bay, be given further consideration, since it is already partly developed, and might be more desirable from a water quality standpoint, especially if Reserve Mining Company's tailings disposal continues for some time (due to prolonged litigations, etc.)

We also question the desirability of open water disposal of dredge spoil. The fact that the bottom sediments of neither bay has been declared polluted by the EPA is not adequate justification for such disposal, especially since no analysis of the sediments has been made to determine sediment conditions. If open water disposal is given further consideration, studies should be done first to determine if the sediments are polluted, and studies should be undertaken before disposal begins to establish a baseline for determining the effect which the disposal will have on benthos, plankton, fish, etc. Such on-going studies should be made part of all projects of this type.

If open water disposal is used, we request to be informed, should the EPA classify the sediments as being polluted.

We would generally object to the suggestion on page 39, paragraph 6.14 that harbors of refuge be located at 15 mile intervals along the North Shore of Lake Superior. We feel that the currently planned spacing of 30 to 40 miles is sufficient given consideration to protecting the scenic beauty of the North Shore.

Thank you for your consideration of these matters.

cc: Archie D. Chelseth
Division Directors
Paul Members
Milt Stenlund

Sincerely,

James H. Kuehn
James H. Kuehn
Planning Administrator

Corps responses to STATE OF MINNESOTA, DEPARTMENT OF NATURAL RESOURCES

30. Open water disposal of dredged material is no longer being considered as a disposal alternative. See paragraphs 1.24-1.30 for a discussion of the proposed disposal method. The effects of in-lake dumping are currently being evaluated by the University of Wisconsin under contract with the Corps of Engineers. Although none of the field studies have involved the Lutsen or Beaver Bay areas, the results should have generic application.
31. Close coordination regarding disposal activities will be maintained.
32. Your position regarding harbor spacing is noted.



MINNESOTA HISTORICAL SOCIETY

400 Cedar Street St. Paul, Minnesota 55101 • 612.296.797

7 February 1975

Colonel Max W. Noah, District Engineer
Saint Paul District Corps of Engineers
1210 U.S. Post Office and Customs House
Saint Paul, Minnesota 55101

Dear Colonel Noah:

RE: Draft Environmental Impact Statement
Harbors-of-Refuge
Lutsen and Beaver Bay, Minnesota

The Draft Environmental Impact Statement for Harbors-of-Refuge at Lutsen and Beaver Bay has been reviewed by the Survey and Planning and Archaeology Sections of the Minnesota Historical Society as per your request of 30 December 1974. It is the opinion of this review that the Lutsen and Beaver Bay Harbor areas suggest a high potential for occurrence of archaeological materials. Little historical research and archaeological survey has been done in that area to date. It is, therefore, evident that such work is extremely necessary prior to implementation of any work which would require dredging, landmoving, or deposit of spoil. Concurrence is made with the statement by Roy W. Reeves, III, which is found in Exhibit 10 of the Technical Appendix of the Draft.

Please contact Mr. Alan E. Woolworth, Chief Archaeologist, Minnesota Historical Society, to arrange for the above mentioned survey.

Respectfully,

Lucille W. Fridley
Lucille W. Fridley
State Historic Preservation Officer

cc: Alan E. Woolworth, Chief Archaeologist
Minnesota Historical Society
Building 27, Fort Snelling
Saint Paul, Minnesota 55111

EWJ/tr

Corps responses to the MINNESOTA HISTORICAL SOCIETY

33. Concur. As noted in paragraph 2.62 the Corps has engaged a contractor to conduct a cultural resources investigation of the areas. The preliminary report indicated that no adverse impact to historical/cultural resources would occur. (See paragraphs 4.83 to 4.88). A summary of the investigation results is presented in paragraphs 2.63-2.71. A copy of the final report will be furnished to your office for review. It should be recognized that the Corps does not have control over induced development. The shoreline areas will be surveyed, however, and the local interests and appropriate agencies advised of any sites in need of protection, salvage, etc.

MINNESOTA POLLUTION CONTROL AGENCY
1935 W. County Road 102, Appleton, Minnesota 55113

(612) 296-7373

February 13, 1975

Colonel M. W. Noah, District Engineer
St. Paul District, Corps of Engineers
1210 U. S. Post Office and Custom House
St. Paul, Minnesota 55101

Dear Colonel Noah:

Agency staff have reviewed the draft EIS on proposed harbors of refuge at Lutsen and Silver Bay and wish to submit the following comments:

According to the project purpose (Sections 1.01 and 1.02 of the draft EIS) harbors-of-refuge for light draft vessels are defined as harbors developed to afford shelter for vessels caught in unexpected storms and forced to seek refuge for preservation of vessel, crew, and passengers. There already exist harbors close to each of the proposed locations which could be used for emergency refuge, for example, the Reserve Mining Company harbor at Silver Bay and Erie Mining Company's Taconite Harbor near Schroeder.

There have been no studies or statistics cited to show how many lives or boats have been lost due to the lack of harbors-of-refuge at the sites proposed. The EIS states that those boaters who have drowned in the past because of inattention to storm warnings would likely not have been able to make port in the proposed harbors-of-refuge either (page 36).

There are no projections of how many people would actually make use of the harbors-of-refuge if they were constructed, other than local residents of Silver Bay who have no area in the immediate vicinity at which to launch or keep their boats.

The draft EIS recognizes that additional development will follow construction of the harbors-of-refuge but does not address the environmental impact of such developments on Lake Superior or surrounding areas. Such things as methods of sewage and waste disposal should be discussed.

Dredging of the proposed harbor at Silver Bay could include tailings eroded from the delta, and the proposed deep water dumping of spoil could result in redistribution of asbestos fibers in Lake Superior (1.14). Alternatives should consider disposing of the dredge spoil on the tailings delta above the area

Corps responses to the MINNESOTA POLLUTION CONTROL AGENCY

34. While the existing harbors near Silver Bay and Schroeder can be utilized for emergency refuge, that is not their primary function. They are commercial harbors and do not adequately fulfill the needs of a harbor-of-refuge. See paragraphs 1.35, 6.01 and 6.02.
35. A check with the U.S. Coast Guard did not reveal any statistics to show how many lives or boats have been lost due to the lack of the proposed harbors; to their knowledge no such statistics are available.
36. Because the project harbors are not subject to benefit/cost analyses, detailed projections of harbor usage have not been made. (See also response number 6.)
37. Impacts of secondary development, as best as they are known at this time, have been included in the final EIS. See paragraphs 4.62-4.73. Such items as methods of sewage and waste disposal are a local responsibility. The methods would have to conform to State and county regulations and as such should be environmentally acceptable. The most likely method to be utilized would appear to be holding tanks.
38. A more detailed discussion of alternative disposal methods has been included in the final EIS. See responses 1, 15, 29, and 30.

February 13, 1975

affected by wave action. No information is provided on locations of designated deep water dredge spoil dump zones in Lake Superior.

Characterization of the bottom sediments at both sites as to pollutional content is essential to any evaluation of alternative spoil disposal methods (1.15). The proposed method of dredge spoil disposal is open lake dumping. As stated in the draft, "past practice has been to dump while moving over the dump zone (usually an open lake zone about one mile in diameter, 50 or more feet in depth) resulting in an extensive turbidity plume or wake behind the moving equipment. This tends to maximize the exposure of dumped sediments to the influence of open lake and longshore current transport with the result that there has been an areal redistribution and resuspension which has affected a much larger area". The environmental impact of open lake dumping, as well as lake edge dumping ("beach nourishment") is a serious and adverse effect. It also violates the water quality standards and effluent limitations for Lake Superior. A rigorous exploration and objective evaluation of all reasonable alternative actions, particularly those that might avoid some or all of the adverse environmental effects, is essential. Therefore, confined, on-land disposal of the dredge spoil should be considered as an alternative and evaluated.

The draft environmental impact statement description of the environment and proposed work lacks any analysis for pollutants present in the sediments and also lacks any specific water quality data on the environment as it exists in the proposed disposal area in Lake Superior. If, as is stated in the draft statement, "Unless the dumping site is of the same chemical 'pollutional' nature as the dredged material, this material obviously adds these 'pollutional' chemicals to the present environment. Heavy metals and toxic compounds will have an impact on the new surroundings to an extent which is related to whether or not the new surroundings are 'clean' or 'dirty', the presence of pollutants in the sediments and the quality of the receiving water should be determined and included in the environmental impact statement. Schedules of recommended sediment and water quality analyses are enclosed.

The dredging and open-lake dredge spoil disposal will have a significant adverse effect on the water quality of Lake Superior. We recommend that the water quality be monitored at the site during dredging and spoil disposal. The recommended water quality analyses previously mentioned should be made.

Wave and current action are likely to cause the turbidity cloud in the vicinity of the dredge to move and affect large areas well removed from the project sites. The adverse impact of the movement of the turbidity cloud can be mitigated by the use of a "pollution curtain" to prevent the movement of suspended material. We recommend the use of a "pollution curtain".

How the proposed use of the land for a small boat harbor and probable induced development in Cook County at Lutten relates to the existing land use plan or zoning ordinance is not indicated (1.18).

Corps responses to the MINNESOTA POLLUTION CONTROL AGENCY (Continued)

39. A more detailed discussion of disposal alternatives has been included in the final EIS as noted above. See section 6.

40. The Corps has conducted a sediment sampling program for the two proposed harbor sites. See response number 1. Your inclosed schedules of recommended sediment and water quality analysis were studied and considered during the development of the sediment sampling programs.

41. The sediment analysis is currently contemplated to involve the elutriate test which gives an indication of the sediment-water interaction and thereby likely water quality impacts. See also response 30. It is believed that these studies will give a more timely prediction of problems to be avoided than would water quality monitoring during dredging.

42. There is not an extensive amount of turbidity anticipated when dredging the proposed harbor sites due to the rocky bottoms present. Consequently, the utilization of "a pollution curtain" may not be necessary. However, such curtains are currently being studied by the Corps, and the results, if available in time, will be considered during preparation of construction plans and specifications.

43. This information has now been included in section 3.

Colonel M. W. Noah, District Engineer -3-

February 13, 1975

444 No data are provided to substantiate the statement that there is a demand for harbors of refuge at intervals smaller than 30 to 40 miles (6.14).

445 The adverse environmental effect of disrupting and changing the natural shoreline of the North Shore of Lake Superior should be seriously weighed. Much of the environmental value of this area is due to its being unaltered by man. There is a danger in the cumulative effect of allowing a relatively small alteration like this proposed project, then five years from now allowing another alteration because it, too, is small, and so on until the cumulative of small projects has resulted in major development of the North Shore. Any development should be done only if it is very necessary, and as part of a soundly based overall plan which has been found acceptable by all interests concerned with the North Shore.

Yours very truly,

L. G. Nichols
Deputy Executive Director

Attachments

cc: Mr. J. Mohr, Environmental Quality Council, St. Paul

Corps responses to the MINNESOTA POLLUTION CONTROL AGENCY (Continued)

44. Information to substantiate this statement has been included in paragraphs 6.13-6.15.

45. Concur; natural resource losses seldom come in large quantities. The intent of the proposed harbors-of-refuge is to provide safety to small craft operators and their boats. See paragraphs 1.01-1.02, 1.31-1.35 and 2.05 for further elaboration of project purpose and need.

MINNESOTA POLLUTION CONTROL AGENCY
DIVISION OF WATER QUALITY
RECOMMENDED SEDIMENT ANALYSES

PARAMETER	METHOD	MINIMUM DETECTION LIMIT (ON A DRY WEIGHT BASIS)	PROCEDURE
1. Total Solids	Gravimetric	0.1%	(a)
2. Volatile Solids	Gravimetric	0.1%	(a)
3. Chemical Oxygen Demand	Dichromate Reflux	10 mg/kg	(a)
4. Total Kjeldahl Nitrogen	Mercuric Sulfate Digestion	1 mg/kg	(a)
5. Total Phosphorus	Persulfate Digestion Colorimetric	0.1 ug/g	(a)
6. Oil and Grease	Extraction with Trichloro- trifluoroethane	1 ug/g	(c)
7. Mercury	Flameless Atomic Absorption (A.A.) Vapor	0.1 ug/g	(b)
8. Lead	Flameless A.A.	0.5 ug/g	(a)
9. Zinc	Flameless A.A.	1 ug/g	(a)
10. Arsenic	Flameless A.A.	10 ug/g	(a)
11. Cadmium	Flameless A.A.	0.1 ug/g	(a)
12. Chromium	Flameless A.A.	5 ug/g	(a)
13. Copper	Flameless A.A.	0.5 ug/g	(a)
14. Nickel	Extraction A.A.	0.5 ug/g	(a)
15. Chlorinated hydrocarbons	Gas Chromatography	0.5 ug/g	(d,e)

(a) CHEMISTRY LABORATORY MANUAL FOR BOTTOM SEDIMENTS, Great
Lakes Region Committee on Analytical Methods, U. S.
Environmental Protection Agency, Federal Water Quality
Administration, December 1969

Recommended Sediment Analyses - 2 - February 4, 1975

- (b) "Mercury in Sediment", Provisional Method, Analytical Quality Control Laboratory, U. S. Environmental Protection Agency, Cincinnati, Ohio, April 1972
- (c) STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, 13th Edition, American Public Health Association, American Water Works Association, and Water Pollution Control Federation
- (d) MANUAL OF ANALYTICAL METHODS, Pesticides and Toxic Substances Effects Laboratory, National Environmental Research Center Research Triangle Park, North Carolina, November 1972
- (e) "Pesticide Reference Standards and Supplemental Data", Pesticides and Toxic Substances Effects Laboratory, November 1973

MINNESOTA POLLUTION CONTROL AGENCY
DIVISION OF WATER QUALITY
RECOMMENDED WATER QUALITY ANALYSES

PARAMETER, UNITS	METHOD	REFERENCE(S)		
		(1)	(2)	(3)
Turbidity, Jackson Turbidity Units	Turbidimeter	Standard p. 350	ASTM p. 467	EPA p. 308
Total Solids, mg/l	Gravimetric 103-105° C	p. 535		p. 280
Volatile Solids, mg/l	Gravimetric 550° C	p. 536		p. 282
Suspended Solids, mg/l	Glass Fiber Filtration 105° C	p. 537		p. 278
Chemical Oxygen Demand, mg/l	Dichromate Reflux	p. 495	p. 219	p. 17
Biochemical Oxygen Demand, mg/l	Modified Winkler or Probe	p. 489		
Oil and Grease, mg/l	Trichloro- trifluoroethane	p. 254		
Total Phosphorus (as P), mg/l	Persulfate di- gestion/single reagent	p. 526	p. 42	p. 235
	or manual digestion and automated single	p. 532		p. 246
Orthophosphate (as P), mg/l	stannous chloride			p. 259
	Direct single reagent, or automatic single reagent, or stannous chloride	p. 532	p. 42	p. 235
Ammonia (as N), mg/l	Distillation- nesslerization or titration automated phenolate			p. 134 p. 141
Organic Nitrogen (as N), mg/l	Digestion, distil- lation/ammonia	p. 469		p. 149

Recommended Water
Quality Analyses

- 2 -

February 4, 1975

<u>PARAMETER, UNITS</u>	<u>METHOD</u>	<u>REFERENCE(S)</u>
Nitrite (as N), mg/l	Colorimetric Diazotization	p.185
Nitrates (as N), mg/l	Cadmium reduction; brucine sulfate;	p.461 p.175 p.185
Fecal Coliform Bacteria, MPN/100 ml	Membrane Filter	P.669 P.684
Mercury, total, mg/l	Flameless Atomic Adsorption	D3223-73
Lead, total, mg/l	Flameless Atomic Adsorption	P.210 P.692 p.110 p.436
Zinc - total, mg/l	Atomic Absorption; colorimetric	P.210 P.692 p.120 p.444
Copper - total, mg/l	Atomic Absorption; colorimetric	P.210 P.692 p.106 p.430
Cadmium - total, mg/l	Atomic Absorption; colorimetric	P.210 P.692 p.101 p.422
Arsenic - total, mg/l	Atomic Absorption; Digestion plus silver diethyldithio carbamate	P.65 P.15 p.62
Chlorinated Hydrocarbons	Gas Chromatography	

Recommended Water
Quality Analyses

- 3 -

February 4, 1975

- (1) "Standard Methods" means Standard Methods for the Examination of Water and Waste Water, 13th Edition, 1971. Available from the American Public Health Association, 1015 - 18th St. N.W., Washington, D.C. 20036
- (2) "ASTM" means Annual Book of Standards, Part 23, Water, Atmospheric Analysis, 1972. Available from the American Society for Testing and Materials, 1916 Race St., Philadelphia, Pennsylvania 19103
- (3) "EPA Methods" means Methods for Chemical Analysis of Water and Wastes, 1971. Available (Stock Number 5501-0067) from the Superintendent of Documents, U. S. Government Printing Office, Washington, D.C. 20402

AD-A100 039

CORPS OF ENGINEERS ST PAUL MINN ST PAUL DISTRICT
LAKE SUPERIOR HARBORS OF REFUGE AT LUTSEN AND BEAVER BAY COOK A--ETC(U)
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AD-A100 039



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STATE OF MINNESOTA
ENVIRONMENTAL QUALITY COUNCIL
CAPITOL SQUARE BUILDING
550 CEDAR STREET
ST. PAUL, 55101

Corps responses to STATE OF MINNESOTA, ENVIRONMENTAL QUALITY
COUNCIL

February 28, 1975

Colonel Max W. Noah
District Engineer
St. Paul District
Corps of Engineers
1210 U.S. Post Office & Custom House
St. Paul, Minnesota 55101

RE: Draft EIS, Harbors-of-Refuge
Lutsen and Beaver Bay, Minnesota
Lake Superior: NCSED-ER

Dear Colonel Noah:

The Minnesota Environmental Quality Council (MEQC) has reviewed the Draft
EIS on the above referenced project and provides the following comments:

1. In reference to the statement p. 21, section 3 which states:

"...the Environmental Quality Council has stated
that it presently appears there will be no conflicts
between the proposed Beaver Bay and Lutsen harbors
and future land uses."

- 4b. This statement should be corrected. The MEQC has not taken any
official position on either of these projects.

2. The Corps of Engineers should also be aware that each of these
projects, in accordance with the 1973 Minnesota Environmental
Policy Act, may require a state environmental assessment under
Minnesota Regulations MEC 25(b)(2)(tt)(i) or (iii) and
possibly a state environmental impact statement.

The MEQC has previously utilized the Federal EIS as the state
document if adequate; however, the Council reserves the right
to request any additional information necessary to fulfill the
requirements of the Minnesota Environmental Policy Act.

3. In light of the above, the Minnesota Environmental Quality Council
will officially place this project on its agenda to be reviewed
relative to the above state requirements.

Sincerely,
Gerald W. Christensen
Gerald W. Christensen, Chairman
Environmental Quality Council

GMC:CE:pj

"AN EQUAL OPPORTUNITY EMPLOYER"

46. This statement has been deleted.



STATE OF MINNESOTA

ENVIRONMENTAL QUALITY COUNCIL
CAPITOL SQUARE BUILDING
500 CEDAR STREET
ST. PAUL, 55101

Corps responses to STATE OF MINNESOTA, ENVIRONMENTAL
QUALITY COUNCIL (Continued)

March 13, 1975

Colone] Max Noah
District Engineer
U.S. Army Corps of Engineers
St. Paul District
U.S. Post Office & Custom House
St. Paul, Minnesota 55102

RE: Draft EIS, Harbors of Refuge, Lutsen and Beaver Bay, Minnesota
Lake Superior: NCSED-ER
STATE REQUIREMENTS FOR ENVIRONMENTAL
ASSESSMENT

Dear Colone] Noah:

The Minnesota Environmental Quality Council, at its March 11, 1974 meeting, reviewed the Corps of Engineers Draft Environmental Impact Statement on the Harbors-of-Refuge, Lutsen and Beaver Bay, and determined that these projects met the mandatory state requirements for an Environmental Assessment under MEQC 25(b)(2)(tt)(i). The EOC will determine if a State EIS is necessary and if required, would utilize the Final EIS as the State EIS, with those additions necessary to fulfill the requirements of Minnesota Rules and Regulations MEQC 31 and 33. This determination will be made at the April 8, 1975 EOC meeting.

Since public hearings are also required on the State Environmental Impact Statements, it is hoped these can take place simultaneously with the Corps. It would be beneficial for all concerned parties to incorporate the State EIS requirements into the Final Federal EIS. This would reduce future delays which may result if the required state information is deficient, thereby necessitating further investigation by local or state agencies and the Corps, following submittal of the Final Federal EIS.

If you should have any questions related to the State EIS process, please contact me at 296-2615.

Sincerely,

Charles R. Kenow
Charles R. Kenow
Environmental Planner

CRK:pj
cc: Mr. Norman M. Hildrum
Chief, Project Evaluation Section
U.S. Corps of Engineers
"AN EQUAL OPPORTUNITY EMPLOYER"

47. These projects will continue to be coordinated with all State agencies to include joint public meetings if desired. Should more significant data be found during further investigations that warrant an EIS supplement, one will be prepared.



STATE OF MINNESOTA

ENVIRONMENTAL QUALITY COUNCIL
CAPITOL SQUARE BUILDING
550 CEDAR STREET
ST. PAUL, 55101

Corps responses to STATE OF MINNESOTA, ENVIRONMENTAL QUALITY
COUNCIL (Continued)

March 24, 1975

48. Discussion of aesthetic values is presented in paragraphs 4.21-4.25.
49. These data have been included in paragraphs 4.68-4.73.

Mr. Robert F. Post, Chief
Environmental Resources Branch
St. Paul District
U.S. Army Corps of Engineers
180 E. Kellogg Blvd.
St. Paul, Minnesota 55101

RE: Draft EIS, Harbors of Refuge, Lutsen and Beaver Bay Minnesota Lake Superior
NCS-ER STATE EIS CONTENT REQUIREMENTS

Dear Mr. Post:

As per your request of March 25, 1975, I am indicating the additional items which would need further clarification or addition to the Federal EIS if it were to meet the content requirements for a State EIS. We understand you are now preparing the Final Federal EIS and we hope this information could be easily incorporated.

Assuming your document follows your guidelines outlined in Appendix C, ER-115-2-507, dated April 15, 1974, there appears to be only minor content expansions necessary.

Under Minnesota Regulations MEC 31, these are as follows:

48. (b) Environmental Impact of the Proposed Action.
Aesthetic values - More discussion is necessary relative to the consequences of the action which may be contrary to the goals and policies of the Act. (MEPA 1973)
- (c) Any direct or indirect environmental, economic, and employment effects that cannot be avoided if the proposed action is implemented.
49. Employment effects - These should be specifically emphasized along with the economic discussion.
- (e) The relationship between local short term uses of the environment and the maintenance and enhancement of long term productivity, including the environmental impact of predictable increased future development of an area if the action is implemented.

"AN EQUAL OPPORTUNITY EMPLOYER"

Mr. Robert F. Post, Chief
U.S. Army Corps of Engineers

-2-

March 24, 1975

Corps responses to STATE OF MINNESOTA, ENVIRONMENTAL QUALITY
COUNCIL (Continued)

50. | The impact of increased future development, direct or indirect,
resulting from the action, must be discussed.

(f) Alternatives to the Proposed Action

51. | Environmental benefits, costs, and risks of alternatives and
modifications of the action should be clearly stated.

In addition to the above, which would be included in your format, the following
items must be added:

52. | (g) The impact on state government of any federal controls associated
with the proposed action.

53. | (h) The multi-state responsibilities associated with the proposed action.

We hope this information will expedite the review process and eliminate duplication
of effort.

If you have any further questions, please call me at 296-2615.

Sincerely,

Charles R. Kenow
Charles R. Kenow
Environmental Planner

CRK:pj

50. The impact of increased future development has been expanded
in the final EIS. See paragraphs 4.62-4.75 and section 7.

51. The alternatives section has been expanded in the final EIS.

52. See paragraph 4.76.

53. See paragraph 4.77.



STATE OF MINNESOTA

STATE PLANNING AGENCY
100 CAPITOL SQUARE BUILDING
550 CEDAR STREET
ST. PAUL, 55101

Corps responses to STATE OF MINNESOTA, STATE PLANNING AGENCY

54. These issues have been further discussed in the final EIS, primarily in the economic and "no project" alternative. Also see response number 6 (U.S. Department of Agriculture).
55. An endorsement of the Lutsen project by the Cook County Board of Commissioners has been included, see exhibit 13.
56. Additional information on the compatibility of these projects and future land use has been included in section 3.
57. This statement has been modified and clarified, see paragraphs 4.62-4.73.

February 28, 1975

Colonel Max W. Noah
District Engineer
St. Paul District
Corps of Engineers
1210 U.S. Post Office & Custom House
St. Paul, Minnesota 55101

RE: Draft EIS, Harbors-of-Refuge Lutsen and Beaver Bay, Minnesota
Lake Superior: NCSED-ER

Dear Colonel Noah:

The State Planning Agency has reviewed the Draft Environmental Impact Statement on the above referenced project and provides the following comments:

- | | |
|----|--|
| 54 | 1. Need for the project - The Draft EIS does not clearly define the current need for the project. Information should be provided on the approximate number of existing small craft usage, location of similar public or private docking facilities and projected locations and estimated completion dates for future Corps of Engineers small craft projects on Lake Superior. |
| 55 | 2. Consistency with local, regional and state plans - The statement indicates that Lake County Board of Commissioners have endorsed the project. However, similar indications of support should be provided for the location at Lutsen. |
| 56 | The Final EIS should include more detailed information on the compatibility of these projects with local objectives and associated land uses adjacent to the proposed harbors. |
| 57 | 3. Social, economic, and environmental effects - The statement indicates:
Section 4.58, "An economic gain to the local area is expected with the provision of harbor facilities by the local interests. Businesses associated with the tourist industry and the small-boat trade would especially benefit." |

Page Two
Colonel Max W. Noah
February 28, 1975

Corps responses to STATE OF MINNESOTA, STATE PLANNING AGENCY
(continued)

This statement should be clarified relative to the business markets existing and projected future use of the harbors. This economic analysis is particularly essential for the Lutsen area which has an estimated population of 75 to 100 persons and must contribute funds to the initial project, while assuming full responsibility for long-term maintenance of the facility.

57.

The statement also indicates other environmental "unknowns" which should be addressed in greater detail in the Final EIS. These include immediate dredging impact (reduction of benthos) on fish resources, including species affected near the sites; deep water disposal of dredged materials; and the absence of detailed plans for mitigating aesthetic impacts of the break-water structures on the natural shoreline.

58.

We appreciate the opportunity to comment and look forward to receiving the Final EIS.

Sincerely,
Gerald M. Christenson

Gerald M. Christenson, Director
State Planning Agency

GMC:CL:pj

58. The final EIS has been expanded to include as much information as is available at this point in our study.

MAYOR
MELVIN W. KOEPLKE
CLERK
EDWARD J. JAROLA

CITY OF SILVER BAY
SILVER BAY, MINNESOTA 55614

February 10, 1975

COUNCILMEN
MARVIN L. STEINBEACH
HAROLD P. THOMPSON
ROBERT M. KING
ALVIN C. BROSNICK

Corps of Engineers
St. Paul District
1210 U.S. Post Office
St. Paul, Minnesota 55101

Attention: Mr. Louis Kowalski

Dear Mr. Kowalski:

I have reviewed a copy of the Draft Environmental Impact Statement, Lake Superior Harbors of Refuge at Lutsen and Beaver Bay.

59. Several places in the draft refer to the Beaver Bay Harbor of Refuge instead of Silver Bay. Would this have any adverse effect on the project at some point in time since the harbor of refuge will be constructed in Silver Bay.

60. According to page 10, paragraph 2.21 a request has been forwarded to the EPA requesting them to perform necessary sampling of sediment and water quality to determine if the proposed harbor should be given a pollutional status classification. I would appreciate receiving any information with respect to the sampling as soon as possible.

61. On page 19, paragraph 2.38 it states "the present census of Silver Bay shows a population of 4,504". The present census of Silver Bay is 3,504.

62. On page 24 of the draft under the heading of "Construction Material" 4.18 it states: "The rock, sand and gravel proposed for use in construction of the proposed breakwaters are expected to come from existing quarries, sand and gravel pits, or local stockpiles". Where are the existing quarries, sand and gravel pits and local stockpiles located? Have the proper owners been contacted to see if procurement of materials at the time of construction will be possible.

Very truly yours,

Melvin W. Koepke
Melvin W. Koepke, Mayor
City of Silver Bay

WMS/caj

Corps responses to CITY OF SILVER BAY

59. While the harbor-of-refuge will be located at Silver Bay, it was described in House Document 446-78-2 and authorized under the 1945 River and Harbor Act as a harbor-of-refuge to be built at Beaver Bay. Consequently, the project is referred to as the Beaver Bay project, and the proposed harbor location at Silver Bay is thought of as the alternate site to the original authorized Beaver Bay location. The impacts of the harbor-of-refuge were addressed with the Silver Bay location in mind. We do not anticipate any adverse effects on the project due to construction of the harbor at Silver Bay rather than at Beaver Bay.

60. Coordination will be continued throughout project studies.

61. This sentence has been corrected.

62. The existing quarries, sand and gravel pits and local stockpiles have been located. The proper owners have also been contacted to see if procurement of materials will be possible. See paragraphs 4.19 and 4.20.

**Advisory Council
On Historic Preservation**
1122 K Street N.W. No. 3-400
Washington D.C. 20005

Max W. Reah
Colonel, Corps of Engineers
District Engineer
Department of the Army
1210 U.S. Post Office & Custom House
St. Paul, Minnesota 55101

Dear Colonel Reah:

This is in response to your request of December 30, 1974, for comments on the environmental statement for Lutsen and Beaver Harbors of Refuge, Cook and Beaver Counties, Minnesota. Pursuant to its responsibilities under Section 102(2)(C) of the National Environmental Policy Act of 1969, the Advisory Council on Historic Preservation has determined that your draft environmental statement is inadequate regarding our area of expertise as it does not contain sufficient information to enable the Council to comment substantively. Please furnish additional data indicating:

a. Compliance with Executive Order 11593 of May 13, 1971.

1. In the case of lands not under the control or jurisdiction of the Federal Government, a statement should be made as to whether or not the proposed undertaking will contribute to the preservation and enhancement of non-federally owned districts, sites, buildings, structures, and objects of historical, archeological, architectural, or cultural significance.

To ensure a comprehensive review of historical, cultural, archeological, and architectural resources, the Advisory Council suggests that the environmental statement contain evidence of contact with the appropriate State Historic Preservation Officer and that a copy of his comments concerning the effects of the undertaking upon these resources be included in the environmental statement.

Should you have any questions or require any additional assistance, please contact Jordan Tannenbaum (202-254-3380) of the Advisory Council staff.

Sincerely yours,

John D. McDermott
John D. McDermott
Director, Office of Review
and Compliance

Corps responses to the ADVISORY COUNCIL ON HISTORIC PRESERVATION

63. Concur. This information has been incorporated into our final EIS. See paragraph 2.61.
64. Concur. See response number 33 to the Minnesota Historical Society, Mr. Russell W. Fridley, State Historical Preservation Officer. Exhibits 10 and 11 are responses to our inquiries regarding the presence of possible sites from the National Park Service and the Minnesota State Historical Society. A cultural resources investigation has been contracted for by the Corps and preliminary results are presented in paragraphs 2.61 - 2.71 of this final EIS.

TECHNICAL

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ST. PAUL DISTRICT, CORPS OF ENGINEERS
DEPARTMENT OF THE ARMY

FINAL
ENVIRONMENTAL IMPACT STATEMENT
HARBORS-OF-REFUGE
LUTSEN AND BEAVER BAY, MINNESOTA
LAKE SUPERIOR

TECHNICAL APPENDIX

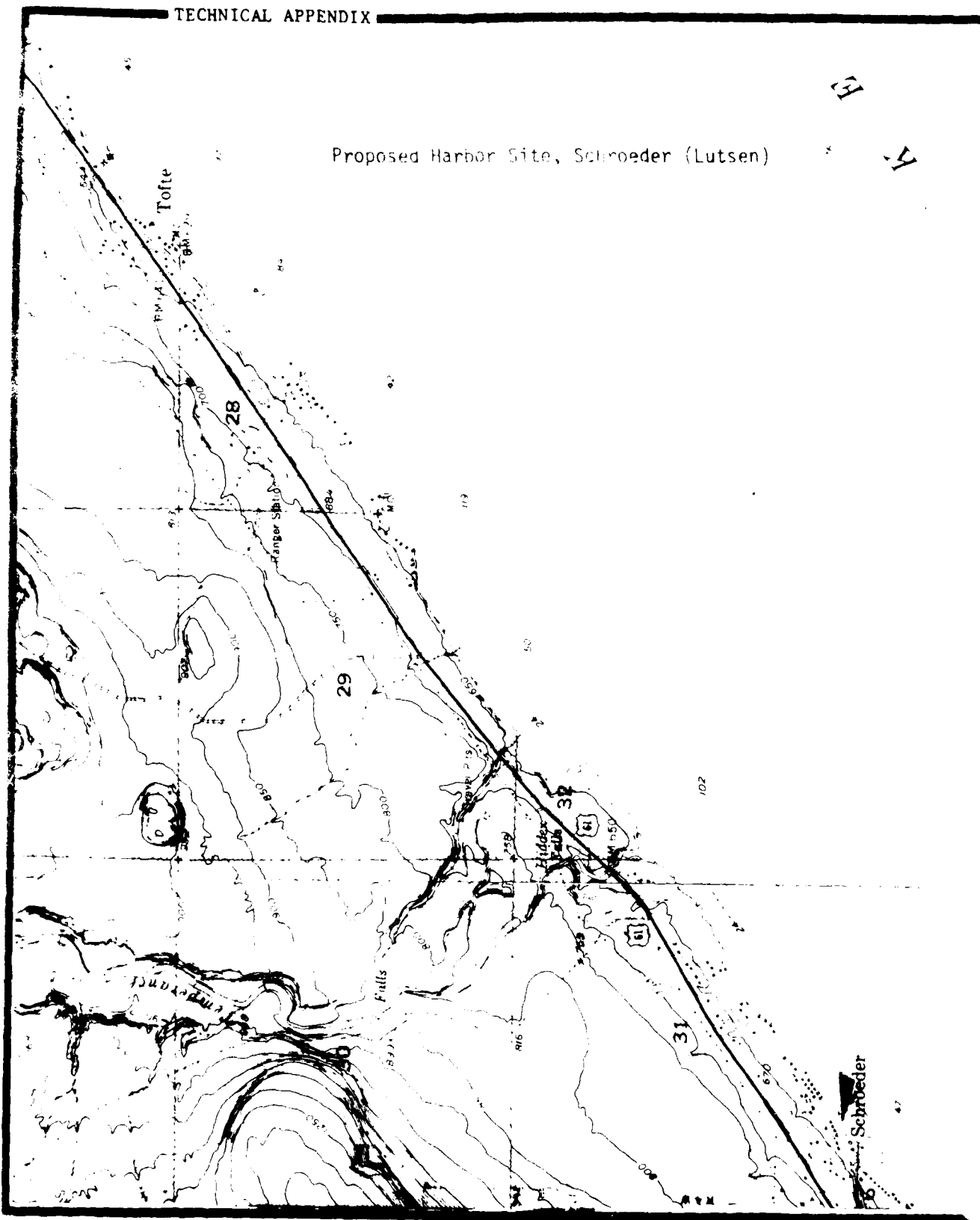
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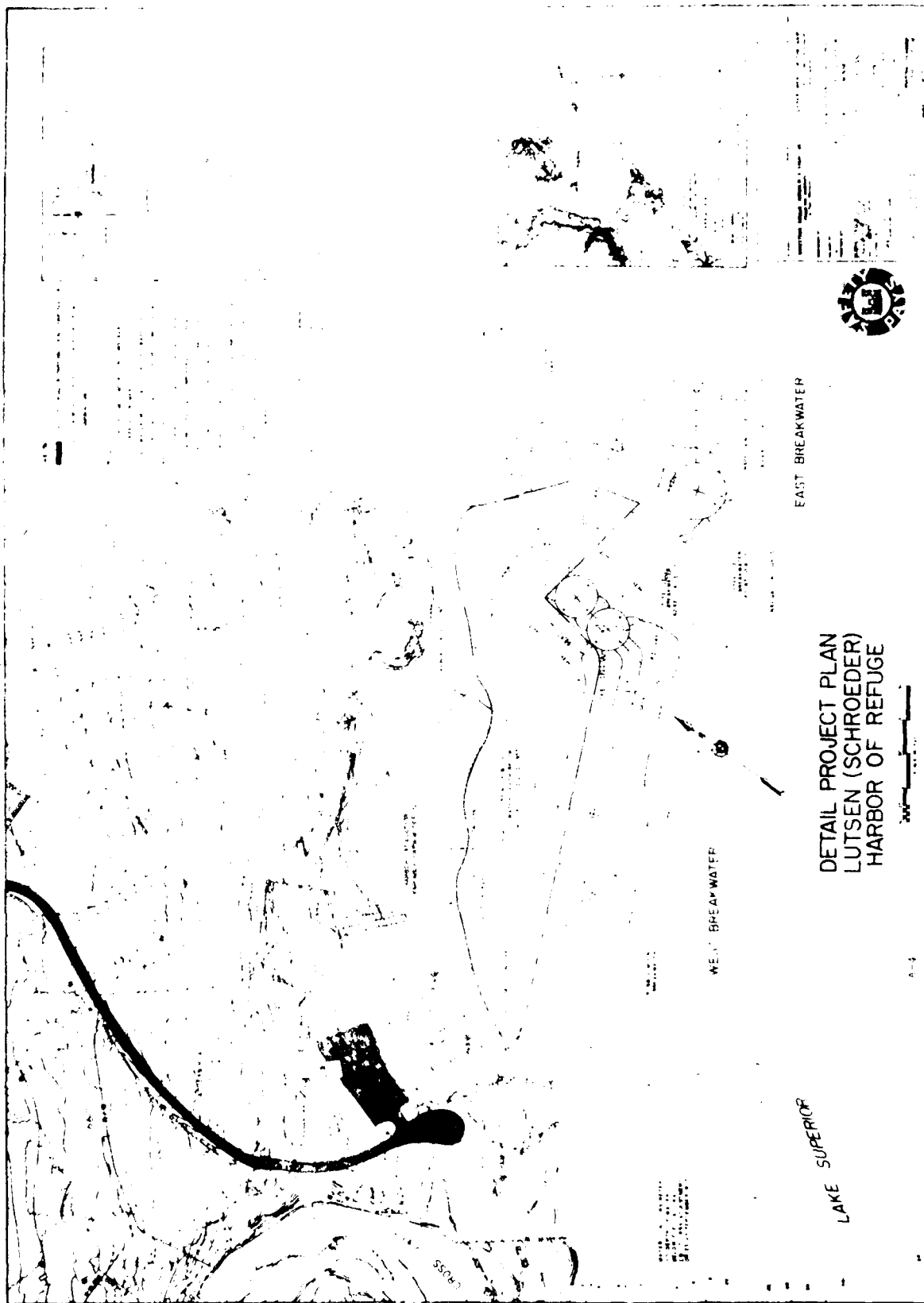
RIVER & HARBOR PROJECTS
ST PAUL DISTRICT
INDEX MAP
LAKE SUPERIOR PROJECTS

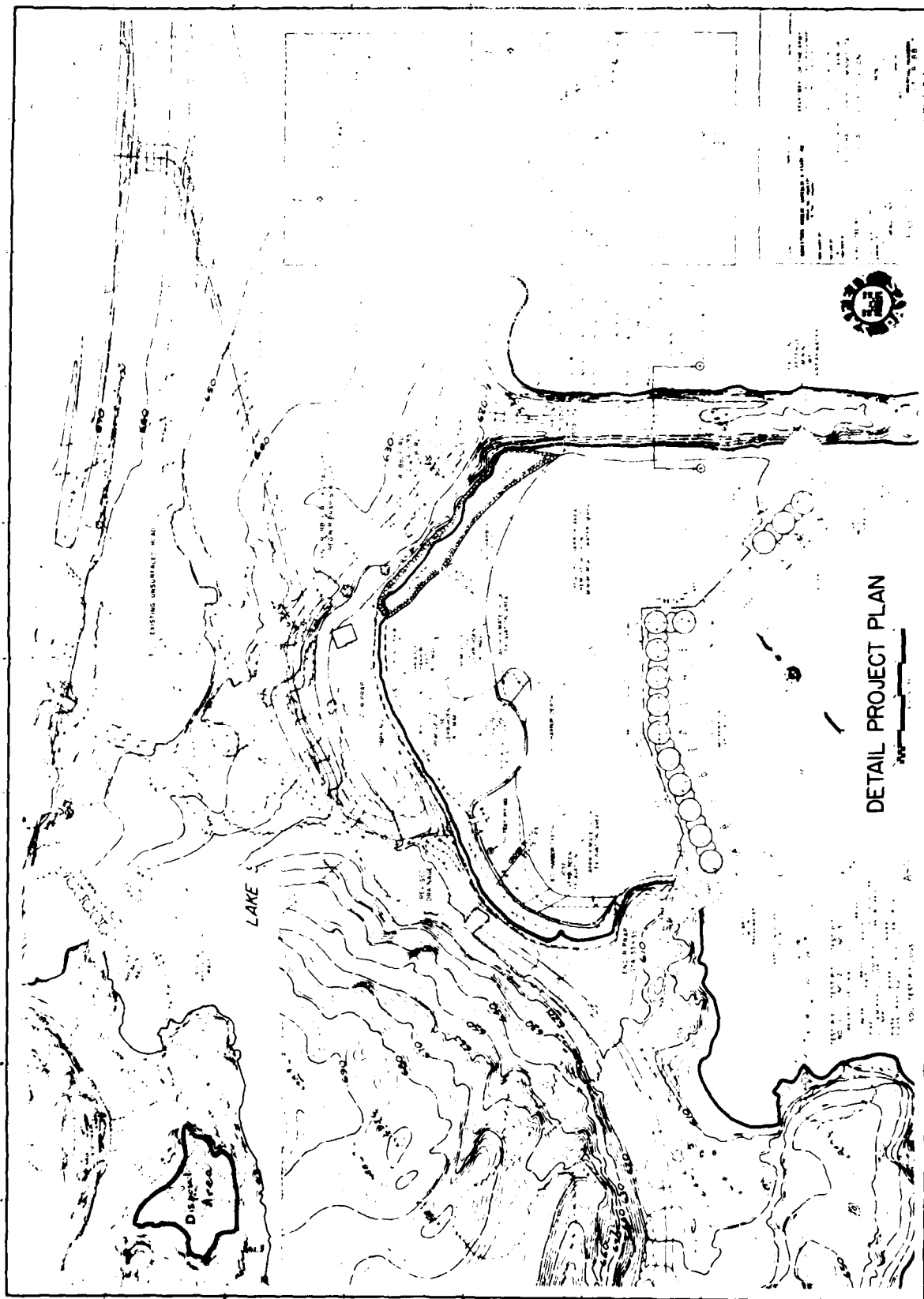
Proposed Harbor Site, Schroeder (Lutsen)



Proposed Harbor Site, Silver Bay (Beaver Bay)







TECHNICAL APPENDIX

Cost Estimate - Schroeder	
Item	Phase II estimate October 1975 price levels
<u>Corps of Engineers and non-Federal costs</u>	
Channels	\$ 63,000
Breakwaters	3,600,000
Engineering and design	196,000
Supervision and administration	237,785
Supervision and inspection	(182,000)
Overhead	(55,785)
Total cost (CofE and non-Federal contribution)	4,096,785
Non-Federal contribution	66,785
Total cost (CofE funds only)	4,030,000
<u>Total non-Federal costs</u>	
Lands and damages	125,000
Construction	33,215
Cash contribution	66,785
Total	225,000
<u>Summary of all estimated costs</u>	
Federal	4,043,000
Corps of Engineers	4,030,000
U.S. Coast Guard	13,000
Non-Federal	225,000
Cash contribution	66,785
Other costs	158,215
Total Federal and non-Federal costs	4,268,000

TECHNICAL APPENDIX

Summary of Estimated Annual Charges - Schroeder

<u>Item</u>	<u>Phase II estimate (October 1975 price levels)</u>
Economic investment	\$4,268,000
<u>Annual charges</u>	
<u>Federal</u>	
Interest and amortization	164,700
Maintenance	16,600
Total Federal	181,300
<u>Non-Federal</u>	
Interest and amortization	9,200
Maintenance	2,900
Total non-Federal	12,100
Total annual charges	193,400

TECHNICAL APPENDIX

Cost Estimate - Silver Bay	
Item	Phase II estimate October 1975 price levels
<u>Corps of Engineers and non-Federal costs</u>	
Channels	\$ 519,000
Breakwaters	1,750,000
Engineering and design	180,000
Supervision and administration	157,875
Supervision and inspection	(110,000)
Overhead	(47,875)
Total cost (CofE and non-Federal contribution)	2,606,875
Non-Federal contribution	38,875
Total cost (CofE funds only)	2,568,000
<u>Total non-Federal costs</u>	
Lands and damages	45,000
Construction	57,125
Cash contribution	38,875
Total	141,000
<u>Summary of all estimated costs</u>	
<u>Federal</u>	(2,580,000)
Corps of Engineers	2,568,000
U.S. Coast Guard	12,000
<u>Non-Federal</u>	(141,000)
Cash contribution	38,875
Other costs	102,125
Total Federal and non-Federal costs	2,721,000

TECHNICAL APPENDIX

<u>Summary of Estimated Annual Charges - Silver Bay</u>	
<u>Item</u>	<u>Phase II estimate (October 1975 price levels)</u>
Economic investment	\$2,721,000
<u>Annual charges</u>	
<u>Federal</u>	
Interest and amortization	105,000
Maintenance	10,600
Total Federal	115,600
<u>Non-Federal</u>	
Interest and amortization	5,700
Maintenance	2,900
Total non-Federal	8,600
Total annual charges	124,200



IN REPLY REFER TO

United States Department of the Interior

NATIONAL PARK SERVICE

WASHINGTON, D.C. 20240

Office of Archeology and Historic Preservation

Interagency Services Division

Denver Field Office

P.O. Box 25287

Denver, Colorado 80225

H3019-PI

Colonel Max W. Noah
St. Paul District, Corps of Engineers
1210 U.S. Post Office & Custom House
St. Paul, Minnesota 55101

Dear Sir:

Thank you for your letter of November 5 requesting advice regarding alternate locations to the harbor of refuge sites at Beaver Bay and Lutsen, Minnesota. I have no specific knowledge of the cultural resources in the possible project areas, but I can point out steps you will need to take in carrying out adequate environmental assessments.

Initially, you must consult the National Register of Historic Places. If any sites listed on the Register will be affected by the project, you must give the Advisory Council on Historic Preservation an opportunity to comment. For instance, Height of Land near Grand Marais in Cook County and Split Rock Lighthouse in Lake County are on the National Register. Will your operations affect these properties in any way?

There is no indication in your letter whether archeological and historical studies have been done in the areas being considered for the harbors. You must contact the State Historic Preservation Officer (Mr. Russell W. Fridley, Director, Minnesota Historical Society, 690 Cedar Street, St. Paul, Minnesota 55101). He can supply information about studies that he is aware of, or resources on state and local inventories. In addition, he can direct you to other sources of information, such as colleges and universities that have conducted work in the area. If studies have not been done, it is your responsibility to assure that the harbor projects will not destroy cultural resources of which you are unaware. This necessitates professional archeological and historical surveys and, in your selection of a final site, adequate consideration of any resources located.

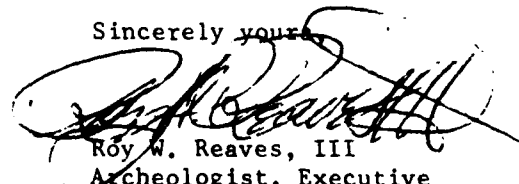
The shore along Lake Superior has high potential for producing archeological and historical remains, due to its physiographic and geographic character. Sites that are favored for development or use today were similarly favored in the past. It is very likely that there will be Pleistocene period archeological remains, and early data regarding the Plains-Woodland developmental relationships may also exist in the area. There are probably on-shore and underwater sites associated with water-related activities. This would include such features as fish wiers, fishing and trading camps, and remnants of trails leading away from the lake. Grand Portage National Monument, north of the subject area, and the Gunflint Trail, near Grand Marais, demonstrate early historic activity by the Voyageurs. There may be other similar trails in the area.

Since your project may be associated with such locations as mentioned above, it is very likely that you will encounter such remains. You will need to assess underwater sites in any places where there will be construction and dredging activity, and also explore fully those areas where dredging debris will be dumped. Rights-of-way for access to the harbor must also be considered.

If you learn of any cultural resources in the area that might qualify for the National Register, you must treat these the same way as properties already listed on the Register. This necessitates giving the Advisory Council an opportunity to comment.

If I can be of any further assistance, please contact me.

Sincerely yours,



Roy W. Reaves, III
Archeologist, Executive
Order Consultant (Denver)

cc: Mr. Russell W. Fridley
Director, Minnesota Historical Society
690 Cedar Street
St. Paul, Minnesota 55101

TECHNICAL APPENDIX

UNIVERSITY OF MINNESOTA
TWIN CITIES

Department of Anthropology
215 Ford Hall
Minneapolis, Minnesota 55455

November 18, 1974

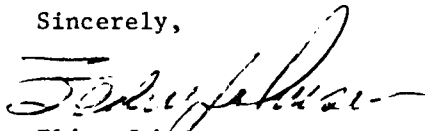
Colonel Max W. Noah, District Engineer
Corps of Engineers
St. Paul District
1210 U.S. Post Office
St. Paul, Minnesota 55101

Ref: NCSSED-ER

Dear Col. Noah:

I am writing in response to your letter of 5 November 1974 requesting information on cultural resources, including archaeological sites, in the areas proposed for harbors of refuge at Beaver Bay and at Lutsen. We have no records of such sites in our files, but neither area has been intensively surveyed by archaeologists or historians. Before I could comment on the impact of harbor construction on such cultural resources, such an intensive survey will be necessary.

Sincerely,



Elden Johnson
State Archaeologist

EJ:ml

CC: Alan Woolworth, Minnesota Historical Society

TECHNICAL APPENDIX

JOHNSON & THOMAS
Attorneys at Law
KORSHOIC BUILDING
SILVER BAY, MINNESOTA 55101
PHONE 426-1100

WAYNE G. JOHNSON
RONALD W. THOMAS

November 21, 1974

Major Norman C. Hintz
Corps of Engineers
Acting District Engineer
1210 U.S. Post Office & Custom House
St. Paul, Minnesota 55101

Re: NCSID-ER

Dear Major Hintz:

On October 15, 1974, Mr. Beacher Elam and myself met with two of your engineers at the City Hall in Silver Bay. A considerable amount of discussion was entered into regarding the proposed harbor or refuge on the westerly side of the Reserve Mining Company breakwater in Silver Bay.

At that time, they discussed certain requirements and that some specific information be forwarded to your office. Incidentally, we thank you for your letter of November 1st to Mayor Koopke, along with the enclosures. These were very helpful to us in our understanding of the project generally.

We have a copy of the letter written on November 20, 1974 by Lester L. Mattson, Planning and Zoning Officer for the County of Lake, wherein he indicates their enthusiastic support of the project, both from his Planning and Zoning Department and from the County Board.

I am also enclosing a letter of January 5, 1972, addressed to Mr. Beacher Elam from R.C. Hemmingshaugh, attorney for Reserve Mining Company. This letter indicates that they are ready, willing and able to transmit the title to the necessary property and clear any incumbrances at any time that we are able to show them that there is actually going to be some form of construction of the harbor or refuge. It appears that their only concern is that it be a well regulated and attractive site and that it conform to all of the necessary government regulations.

DISTRICT ENGINEER
SILVER BAY, MINNESOTA
COPY 1010103

TECHNICAL APPENDIX

Major Norman G. Hintz
November 27, 1974

Page Two

I am enclosing a copy of that letter for your convenience. A letter was sent in January to your office.

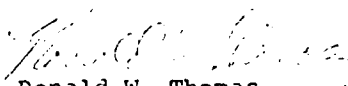
I am also enclosing a copy of the letter of November 17, 1969, by the Village Attorney, which included a copy of the Resolution by the Village Council and Mayor. It appears that the three copies of the minutes were forwarded to your office at that time.

Two days ago I discussed this matter with Mr. Hemmersbaugh from Rexelve Mining Company and he indicated that they are still in accord with their letter of January 5, 1972.

If there is anything further you should require or any form of confirmation of any of these documents at this time, we will be happy to supply the same immediately.

Thank you very much for your courtesies and cooperation throughout.

Yours truly,


Ronald W. Thomas

RWT:rjr
Encs.

SEE THE—



North Shore Scenic Drive
Lake Superior
International Highway

PLANNING AND ZONING OFFICE

COUNTY OF LAKE
COURT HOUSE
TWO HARBORS, MINN. 55616
Phone (218) 834-4352

LESTER L. MATTSON
PLANNING & ZONING OFFICER

Solid Waste Management
Environmental Health

November 20th, 1974

Major Norman C. Hintz,
Corps of Engineers
Acting District Engineer
1210 U. S. Post Office & Custom House
St. Paul, Minnesota 55101

Re: NCSED-EH

Dear Major Hintz:

I am responding to your letter addressed to Mayor Koenke of Silver Bay, dated November 1, 1974, regarding the proposed construction of a harbor of refuge on Lake Superior near Beaver Bay, Lake County, Minnesota. Your letter was referred to my office because the affected area is in an unincorporated area under County zoning jurisdiction. The affected area is presently zoned to reflect the classification of Lake Superior, which is a General Development classification, under the Interim Shoreland Ordinance of Lake County.

County-wide zoning regulations are currently being reviewed by the Lake County Planning Advisory Commission, with technical assistance from the Arrowhead Regional Development Commission, which will incorporate most of the requirements of the existing Interim Ordinance. The affected areas and will be zoned to reflect recreational and residential uses and the harbor of refuge will be, in all likelihood, a permitted use, and at the very least, a permitted use subject to conditional use application.

I might also add that the Lake County Board of Commissioners have already enthusiastically endorsed this project and I believe there is a Resolution on the County books to support this endorsement.

If you have any further questions, regarding this project, please feel free to contact this office at any time. Thanking you, I am,

Sincerely yours,

Lester L. Mattson
Lester L. Mattson
Planning and Zoning Officer

LLM/p
cc: Mayor Koenke

TECHNICAL APPENDIX

Extract from the Minutes of the Regular
Meeting of the Board of Commissioners of
Cook County, Minnesota, held at Grand
Marais, Minnesota on November 13, 1974

The following Commissioners were present at said meeting:

B. V. Johnson
Robert R. McClanahan
Kenneth T. Olsen
Sidney Backlund
James Hull

The following Commissioners were absent: None.

Motion was made by Olsen to continue with the Study on the proposed
Harbor of Refuge project in the Lutsen vicinity as set out in
Resolution No. 74-48.

R E S O L U T I O N

WHEREAS, the Congress of the United States, by Public Law 14, 79th Congress, 1st Session, approved March 2, 1945, has authorized the department of the Army, acting through the Corps of Engineers, St. Paul District, to construct a Harbor of Refuge in the vicinity of Lutsen, Minnesota, on Lake Superior; and

WHEREAS, the County of Cook, Minnesota, is authorized under law and is willing and able, legally and financially, to fulfill the conditions of local cooperation; and

WHEREAS, the exact location of said Harbor of Refuge has not yet been ascertained, but a number of alternate sites have been considered, all of which sites are within the County of Cook; and

WHEREAS, this project would be of substantial and special economic value and benefit to the County of Cook;

NOW, THEREFORE, BE IT RESOLVED That in order to comply with the authorizing Act of Congress and to give the required assurances of local cooperation the Board of Commissioners of the County of Cook does hereby undertake, agree and assure the Secretary of the Army that it will:

- a. Make a cash contribution toward the first cost of dredging and construction of protective works in the amount of \$66,785.00, for said harbor;
- b. Provide and maintain, without cost to the United States and in accordance with plans approved by the Chief of Engineers, a suitable and adequate public wharf for the accommodation of transient vessels;
- c. Establish a competent and properly constituted public body empowered to regulate the use, growth, and free development of harbor facilities with the understanding that harbor facilities shall be open to all on equal and reasonable terms;
- d. Hold and save the United States free from damages due to the construction and maintenance of the works;
- e. Provide, without cost to the United States, all lands, easements, and rights-of-way necessary for the construction of the project, including suitable spoil areas where and as required;
- f. Provide payments and services as required by sections 210 and 305 of Public Law 91-646;
- g. Assure that, in acquiring real property, the sponsor will be guided to the greatest extent practicable under State Law by the land acquisition policy in sections 301 and 302 of Public Law 91-646, and that property owners will be paid or reimbursed for necessary expenses as specified in sections 303 and 304.

TECHNICAL APPENDIX

- h. Assure that, within a reasonable time prior to displacement, decent, safe, and sanitary replacement dwellings will be available to displaced persons.

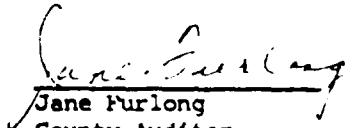
BE IT FURTHER RESOLVED That certified copies of this Resolution be furnished to and filed with the District Engineer, U. S. Army Corps of Engineers at St. Paul, Minnesota, as assurance to the Secretary of the Army of the willingness and ability of the County of Cook to fulfill the conditions of the authorizing legislation for the project and to cooperate with the United States in the construction, operation and maintenance of said harbor; and

BE IT FURTHER RESSOLVED That the Chairman of the Board of Commissioners of the County of Cook is hereby authorized to execute on behalf of the Board of Commissioners of said County any further or separate agreements with respect to the County's compliance with said assurances.

Said Motion was seconded by Commissioner Backlund. Upon vote being taken upon the question of the adoption of said Resolution, all of the above-mentioned Commissioners voted in favor thereof, whereupon the Resolution was declared duly passed and adopted.

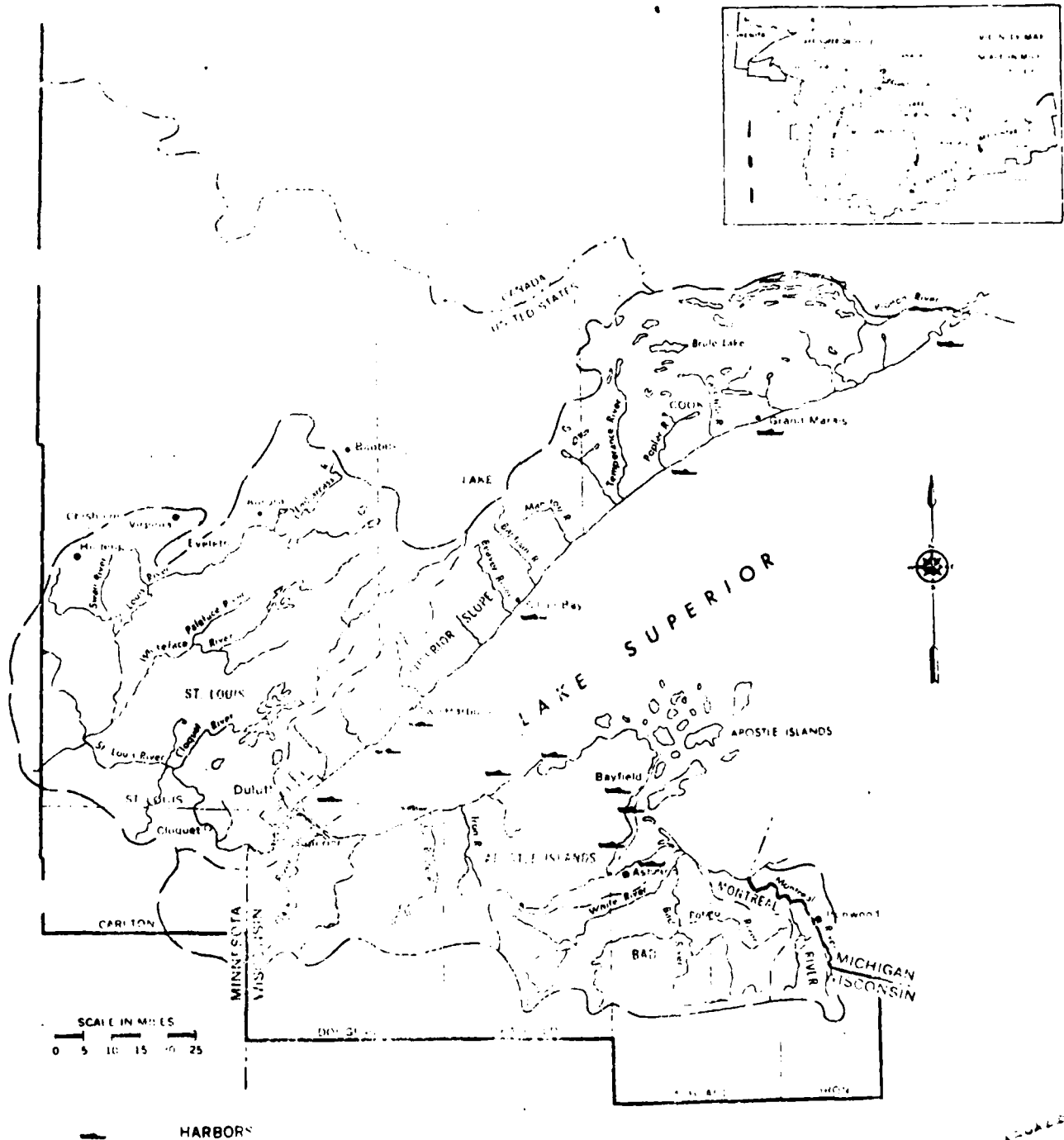
C E R T I F I C A T E

I, Jane Purlong, the Auditor of the County of Cook, Minnesota, do hereby certify that I am the duly elected, qualified and acting Auditor of said County, and that as said Auditor I have in my custody, control and possession all of the books and records of said County; that the attached Extract of Minutes containing a Resolution adopted by the Board of Commissioners of Cook County is a true and correct copy of the extract of the proceedings of the Regular Meeting of said Board of Commissioners held on November 13, 1974, at which time said resolution was adopted, and the said attached extract of said Minutes contains a true and correct copy of the original Resolution of said meeting now in my possession.


Jane Purlong
County Auditor
Cook County, Minnesota

[illegible]

A-20
IS FROM THE SET "HALL OF MIRRORS"
AND IS CONTAINED TO LDC



U.S. HARBOR FACILITIES ON LAKE SUPERIOR

TECHNICAL APPENDIX

U.S. HARBOR FACILITIES ON LAKE SUPERIOR

Harbor	Distance to next harbor or refuge	Remarks
1. Grand Portage, Minn. Non-Federal small- boat harbor ^a	35	No facilities available. Local interests have constructed an unprotected dock. Sec. 107 study is underway.
2. Grand Marais, Minn. Federal commercial & small-boat harbors	19	Facilities considered adequate for existing traffic.
3. Lutsen, Minn. ^{b,c} ,	38	A federal small-boat harbor has been authorized. Phase II, GDM studies were initiated in FY 75.
4. Beaver Bay, Minn. ^{b,c}	26	A federal small-boat harbor has been authorized. Phase II, GDM studies were initiated in FY 75.
5. Two Harbors, Minn. Federal commercial harbor	7	Provides refuge. Limited small-boat facilities available.
6. Knife River, Minn. Federal small boat harbor ^{c,d}	19	Used primarily by commercial fishermen. Local interests have constructed additional small-boat facilities. A serious wave problem exists & an additional breakwater is proposed for construction.
7. Duluth-Superior, Minn. & Wis. Federal commercial harbor ^c	23	Local interests have constructed small-boat facilities. Provides refuge.
8. Amnicon, Middle, & Brule Rivers, Wis. ^a	11	Small-boat facilities do not exist. Funds for authorized survey study not available.
9. Port Wing, Wis. Federal small-boat harbor	17	Facilities considered marginal for existing traffic.
10. Cornucopia, Wis. Federal small-boat harbor	36	Facilities considered adequate for existing traffic.

U.S. HARBOR FACILITIES ON LAKE SUPERIOR

Harbor	Distance to next harbor or refuge	Remarks
11. Bayfield, Wis. Federal small-boat harbor ^d	2	Local interests have developed additional facilities. Possible modifications to correct a serious wave problem are being investigated.
12. La Point, Wis. Federal small-boat harbor	7	Serves primarily commercial fishing & ferry boats. Provides refuge. Local interests have developed a small-boat harbor.
13. Washburn, Wis. ^a	8	Limited facilities are available for small boats.
14. Ashland, Wis. Federal commercial harbor ^a	28	Provides refuge but small-boat facilities are inadequate. Sec. 107 detailed project study has been suspended at the request of the local sponsor.
15. Saxon Harbor Saxon, Wis.		Facilities are considered marginal for existing traffic.

TECHNICAL APPENDIX

U.S. HARBOR FACILITIES ON LAKE SUPERIOR

Harbor	Remarks
1. Little Girls Point, Mich. ^a	Limited facilities available. Local interests have requested an investigation to determine feasibility for constructing a harbor.
2. Black River, Mich. Federal small-boat harbor	Facilities are considered marginal.
3. Ontonagon, Mich. ^c Federal commercial harbor	Provides refuge. A small-boat marina is under construction.
4. Misery River, Mich. ^a	No facilities available. Survey study for small-boat harbor is currently inactive.
5. Keweenaw Waterway, Mich. Upper Entry- Federal commercial harbor ^d	Provides refuge. Facilities for Small boats have not been provided.
6. Eagle Harvor, Mich. ^c Federal small-boat harbor	Facilities considered adequate although a surge problem exists within the harbor. Michigan Waterways Comm. has provided facilities.
7. Copper Harbor, Mich. Non-Federal small-boat harbor	Michigan Waterways Comm. has provided small-boat facilities.
8. Lac La Belle, Mich. Federal small-boat harbor	Facilities considered adequate for existing traffic.
9. Grand Traverse, Mich. ^d Federal small-boat harbor	Serves primarily commercial fishing boats. Facilities considered inadequate for recreational craft.
10. Keweenaw Waterway, Mich. ^d (Portage Entry)	Provides refuge. Limited small boat facilities have been provided.

TECHNICAL APPENDIX

U.S. HARBOR FACILITIES ON LAKE SUPERIOR

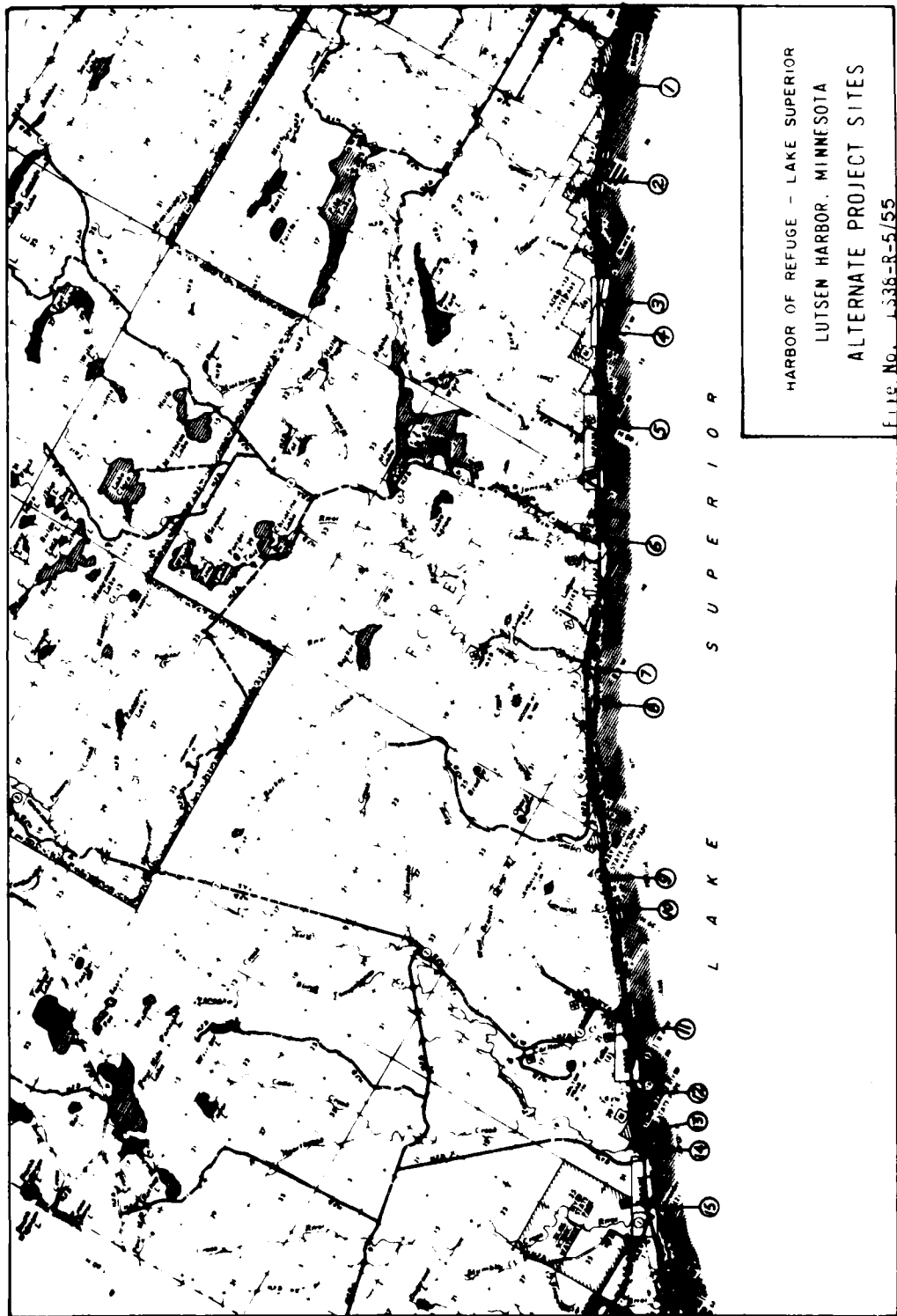
Harbor	Remarks
11. L'Anse, Mich. ^a	Some facilities are provided.
12. Huron Bay, Mich. ^a Natural harbor	Provides refuge. Limited private development.
13. Big Bay, Mich. Federal small-boat harbor	Facilities considered adequate for existing traffic.
14. Presque Isle, Mich. Federal commercial harbor	Provides refuge. A small-boat marina has been constructed by local interest.
15. Marquette, Mich. ^c Federal commercial harbor	Provides refuge. Limited small-boat facilities available.
16. Au Train, Michigan ^a	No facilities available. A survey study has been authorized but not funded.
17. Munising Harbor ^{a,d} No Federal Project.	Ruins of old commercial docks. Several small private docks municipal launching ramp. Small public dock. Additional berthing & docking facilities needed. Needs breakwater protection.
18. Grand Marais Harbor ^{c,d} Federal project depth - 18 feet.	Part of harbor endangered by deterioration of pile dike. Expansion of docking & launching facilities needed.
19. Little Lake Harbor ^c Federal project depth - 12 feet.	Harbor entrance shoals rapidly. Harbor facilities are adequate.
20. White fish Bay Harbor ^d	Needs new dock and launching facilities.
21. Tahquamenon River (Mouth) ^{a,d}	New harbor site. Channel dredging and piers required. Local interests would furnish dock and launching sites.

TECHNICAL APPENDIX

U.S. HARBOR FACILITIES ON LAKE SUPERIOR

Harbor	Remarks
22. Brimley (Waiska River) a,d	Natural harbor at mouth of river. Federal Government has performed emergency dredging. Need additional channel dredging, breakwater protection & docking & launching facilities. Study has been authorized, but not initiated.
23. Sault Ste. Marie (St. Marys River)	Small harbor constructed by city downstream of locks; study has been authorized, but not initiated.

- ^a Sites which could be studied in the interest of refuge or basing small boats.
- ^b Harbor where construction of authorized improvements, not yet initiated, should be undertaken in the interest of small boats.
- ^c Constructed harbors which warrant further study to determine advisability of further improvement of general navigation facilities in the interest of small boats.
- ^d Harbors where improvements by local interests are needed for small boating.



AUTHORIZATION FOR RECREATION DEVELOPMENT AT WATER RESOURCE PROJECTS

In Section 4 of the Flood Control Act of 1944, Congress authorized the Chief of Engineers "...to construct, maintain, and operate public park and recreation facilities at reservoirs under the control of the Secretary of the Army...". The Flood Control Act of 1962 broadens the authorities (established by the 1944 Act) to be applicable to all water resource projects.

In 1959 and 1962, Corps policy was established by the Chief of Engineers which requires recreation development to be considered at every Corps water resource project. Corps policies also state that the objective of Corps recreation resource activities is to insure continued public enjoyment and maximum sustained use of lands, waters, forests and associated recreational resources, consistent with their carrying capacity and their aesthetic and biological values. Corps policy which applies to these proposed recreation developments (ER 1120-2-404) requires that a non-Federal entity must provide all required lands and assume responsibility for 50 percent of the cost of development and operate, maintain, and replace facilities of that development. The recreation development would be on the lands required for the harbor of refuge project.

July 1, 1976

Parks and Recreation Grants Section
Room 15, Capitol Square Building
St. Paul, MN 55101

Gentlemen:

We enclose herewith on behalf of the Town of Schroeder, Cook County, Minnesota, the Preliminary Application for LAWCON and LCMR Grants, said grants to be used for acquisition of necessary lands to support the Harbor of Refuge to be built by the U.S. Army Corps of Engineers at Schroeder, Minnesota.

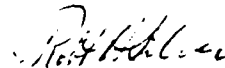
We also enclose herewith the required topographic maps and a copy of the latest developmental plan which is being designed by the personnel at the Corps of Engineers.

Copies of this material have also been forwarded to the Arrowhead Regional Development Commission, 200 Arrowhead Place, 211 West 2nd Street, Duluth, Minnesota, pursuant to the instructions contained in your LAWCON packet.

It is the intent of the Town of Schroeder to take all steps necessary, including personal appearance by representatives of the Town at your meetings in the fall of 1976, to qualify for the grants making it possible to acquire lands supporting the Harbor of Refuge.

If you have any questions, please feel free to contact this writer by telephone so that the preliminary application of the Town of Schroeder will be deemed to have been submitted timely.

Thank you,



Robert Silver
Chairman, Town Board
Town of Schroeder
Cook County, Minnesota

Encl.

June 25, 1976

Department of the Army Corps of Engineers
St. Paul District
St. Paul, MN 55101

RE: Town of Schroeder
Harbor of Refuge Project
Letter of Intent - Recreational Complex (Phase II)

Gentlemen:

Pursuant to the authority granted by the electors of the Town of Schroeder in a special meeting called for that purpose, the Town Board, and the Town of Schroeder, by the undersigned, are authorized to provide this letter of intent as follows:

Whereas the Town of Schroeder is jointly engaged in a project to construct a Harbor of Refuge at or near the Town of Schroeder as Phase I of a development project, and whereas contingent upon the said Phase I project going into effect, the Town Board, as and for Phase II of said project agrees to and does intend to enter into a contract with the Department of the Army, Corps of Engineers, as follows:

1. Alternative III of the proposed project of the U.S. Army Corps of Engineers to be implemented upon the site and, at or near the said Harbor of Refuge.
2. The Town of Schroeder will assume at least one-half of the separable first cost of construction of the recreation facilities and site preparation;
3. The Town of Schroeder will assume all cost and full responsibility for the operation, maintenance, replacement, and management of the said recreation areas and facilities.
4. Assuming that a mutually acceptable plan is developed and approved, the Town of Schroeder intends to enter into a formal contract to operate, maintain, replace, and cost-share the said development facilities;
5. The Town of Schroeder has the capability of doing the above;
6. The approximate cost of development, understanding that they are preliminary and subject to modification, is \$65,000.00;

7. The Town of Schroeder intends to make repayment of the non-federal share of the development costs by payment in cash during the construction periods; through provision of lands or facilities for the project; by replacement, with interest, on the unpaid balance at a rate comparable to that for other interest-bearing functions of the said projects, by obtaining funds for development projects from the State of Minnesota through the LAWCON Projects of the Minnesota State Planning Agency, Office of Local and Urban Affairs, or by a combination of these;

8. The Town of Schroeder understands that Alternative III as presented and accepted by the Town Board includes:

(a) Provisions for a concrete boat launch facility, and graveled parking lot;

(b) Blacktopping of access road or roads;

(c) A picnic area, of minimum size, located adjacent to the parking lot facility;

(d) Sanitary facilities to be constructed in accordance with the plans of the U.S. Corps of Engineers;

(e) Construction of a permanent docking facility.

This letter shall constitute a letter of intent only and shall not be deemed to be binding upon the Town of Schroeder or the undersigned, and is contingent upon the development of Phase I of said project, and upon finalization of plans for said Phase II of the project herein contained.

Respectfully submitted,

TOWN OF SCHROEDER

By: _____

and _____

Theresa L. Smith
Schroeder Town Clerk

PRELIMINARY APPLICATION FOR LAWCON AND LCMR GRANTS

1. Application for Land and Water Conservation Fund and/or LCMR grants for FY1977. Application to be submitted to the State Planning Agency on July 8, 1976.

2. The applying unit of government is the Town of Schroeder, Cook County, Minnesota, 55613.

3. The person responsible for application is Robert Silver, Chairman, Town Board, Schroeder, Minnesota, telephone 218-663-7210.

4. The name of the project is Lake Superior Harbor of Refuge.

5. The type of project is acquisition of support lands to the Harbor of Refuge.

6. The proposed use of the area to be acquired is to permit access to the Harbor of Refuge, which access and other ancillary use of the land are required by the U.S. Army Corps of Engineers in its design of the Harbor of Refuge.

7. The estimated cost and acreage of the support lands which are to be acquired is approximately \$200,000.00. The Town of Schroeder must acquire, in fee simple, title to approximately 600 feet of Lake Superior lakefront lands and an easement required by the U.S. Army Corps of Engineers on an additional 400 feet of Lake Superior lakefront. In addition to those lands which will be fronting the Harbor of Refuge, the Town must also acquire, in fee simple, title to an additional parcel of land of approximately 1/4 acre which will provide land access to the east breakwater which will form a portion of the Harbor, and an easement to a service road to permit service of the east breakwater.

8. Attached hereto and made a part of this preliminary application is a copy of the Schroeder Quadrangle Map showing the location of the proposed Harbor of Refuge and lands to be acquired.

9. Attached hereto and made a part of this preliminary application is a copy of the latest design plan put forth by the U.S. Army Corps of Engineers showing the location of the breakwaters and the use of the land to be acquired for the project.

10. At present the Town of Schroeder is considering the development of the Harbor of Refuge to be its sole project over the next five years. No other park or recreation projects are under consideration at this time.

11. The Town of Schroeder, Harbor of Refuge should be a high priority regional development for the North Shore of Lake Superior. At present, there are no safe harbors for small boats between Grand Marais, Minnesota, and Knife River, Minnesota. This distance, approximately 110 miles of the North Shore of Lake Superior contains three industrial

Harbors, Two Harbors, Minnesota, Silver Bay, Minnesota, and Taconite Harbor, Minnesota, all three of which are primarily industrial harbors used by the iron ore industry. The U.S. Army Corps of Engineers is seeking to alleviate the lack of safe harbors for small boats by construction of two Harbors of Refuge, one at Schroeder, Minnesota, and one at Silver Bay, Minnesota. The site at Schroeder is well-founded in that it is approximately equi-distant from Grand Marais to Schroeder to Silver Bay to Knife River, thus providing Harbors of Refuge for the increasing volume of small boat usage on Lake Superior. This is truly a regional development in that its use will be spread to persons primarily outside of the immediate Schroeder, Minnesota area.

12. The Town Board of the Town of Schroeder has allocated \$33,000.00 from its general fund as its contributive share to construction of the Harbor of Refuge breakwaters and harbor improvement. In addition, the Town of Schroeder has in its general fund adequate funds to satisfy the either LAWSON or LCMR requirements of local governmental unit pro rata proportional funding.

MAYOR
MELVIN W. KOEPKE

CLERK
EDWARD J. AHOLA

CITY OF SILVER BAY
SILVER BAY, MINNESOTA 55614

COUNCILMEN
ROBERT H. KIND
ALVIN C. GROSNICK
HAROLD F. THOMPSON
MARVIN L. STEINBACH

May 19, 1976

Col. Forrest T. Gay
United States Army
Corps of Engineers
St. Paul District
1135 U.S. Post Office & Custom House
St. Paul, Minnesota 55101

Dear Col. Gay:

The City of Silver Bay is interested in recreation plans in connection with the development of the proposed Harbor of Refuge at Silver Bay.

The main projects of interest are as follows:

1. Toilet facilities
2. Access road
3. Parking lot
4. Boat launching ramp and docking facilities
5. Lighting of parking area and launching area
6. Refueling facilities
7. Sanitary disposal holding tanks
8. Shelter for inclement weather
9. Picnic area

The city council would greatly appreciate any assistance by the Corps of Engineers in the planning and obtaining of funds or grants for the above listed projects.

Thank you.

Very truly yours,

Melvin W. Koepke
Melvin W. Koepke, Mayor

MKW/caj

cc: Mr. Edward L. McNally

R E S O L U T I O N

AUTHORIZING LETTER OF INTENT FOR SUPPORT FACILITIES FOR HARBOR OF REFUGE

WHEREAS, the City of Silver Bay has heretofore authorized participation with the Corps of Engineers in providing for a Harbor of Refuge at Silver Bay, Minnesota, and,

WHEREAS, the Corps of Engineers have submitted a proposal designated as Alternate No. 2 on the drawing on file with the City Clerk for Support Facilities for the Harbor of Refuge at an estimated cost of \$99,000.00 requiring 50% local participation, and

WHEREAS, such Support Facilities would be desirable and increase the utility of the Harbor of Refuge and is to the best interest of the public.


BE IT RESOLVED, the City Council of Silver Bay indicates the desire and intent of the City of Silver Bay to participate in the Proposed Alternate #2 for the Harbor of Refuge at Silver Bay, Minnesota, provided the City has funds available or can provide for funding from other sources prior to the time any Contract for Construction is authorized.

BE IT FURTHER RESOLVED, that the Mayor be authorized and directed to submit a Letter of Intent to the United States Corps of Engineers incorporating the terms of this Resolution.

Adopted this 7th day of June, 1976.


Melvin W. Koepke, Mayor

ATTEST:


Edward J. Arola, City Clerk

C E R T I F I C A T I O N

I do hereby certify that I have compared the foregoing resolution with the original filed in my office the 7th day of June 1976 and that the same is a true and exact copy of the whole thereof.


Edward J. Arola, City Clerk

SEAL

MAYOR
MEVIN W. KOEPKE

CLERK
EDWARD J. AROLA

CITY OF SILVER BAY
SILVER BAY, MINNESOTA 55614

COUNCILMEN
ROBERT H. KEND
ALVIN C. GROBNICK
HAROLD F. THOMPSON
MARVIN L. STEINBACH

June 8, 1976

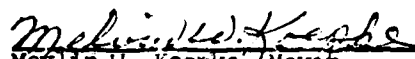
Edward L. McNally
U. S. Army, Corps of Engineers.
St. Paul District
1135 U. S. P. O. & Custom House
St. Paul, Minnesota, 55101

Dear Mr. McNally:

Attached please find resolution incorporating the letter of intent concerning the Silver Bay Harbor of Refuge as requested by the Corp of Engineers. If anything further is required please let me know.

Very truly yours,

CITY OF SILVER BAY


Mevin W. Koepke, Mayor

MWK/eja

R E S O L U T I O N

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Melvin W. Koepke, Mayor

ATTEST:


Edward J. Arola, City Clerk

C E R T I F I C A T I O N

I do hereby certify that I have compared the foregoing resolution with the original filed in my office the 7th day of June 1976 and that the same is a true and exact copy of the whole thereof.


Edward J. Arola, City Clerk

SEAL



SANITARY ENGINEERING LABORATORIES, INC.
2982 N. Cleveland Ave. Roseville, Mn. 55113 (612) 636-7173



Sediment Analysis Data - Silver Bay

REPORT OF LABORATORY ANALYSIS
(Methodologies EPA approved)

02/25/76 17:27

CLIENT: Department of the Army
St. Paul Dist., Corps of Engr.
1210 U.S. P.O. & Custom House
St. Paul, MN 55101
C. Bonasera

CLIENT NO: 1700

SAMPLE TYPES: BOTTOM SEDIMENT

SAMPLE(S) COLLECTED BY: CLIENT

DATE COLLECTED: 10/16/75

DATE RECEIVED: 01/06/76

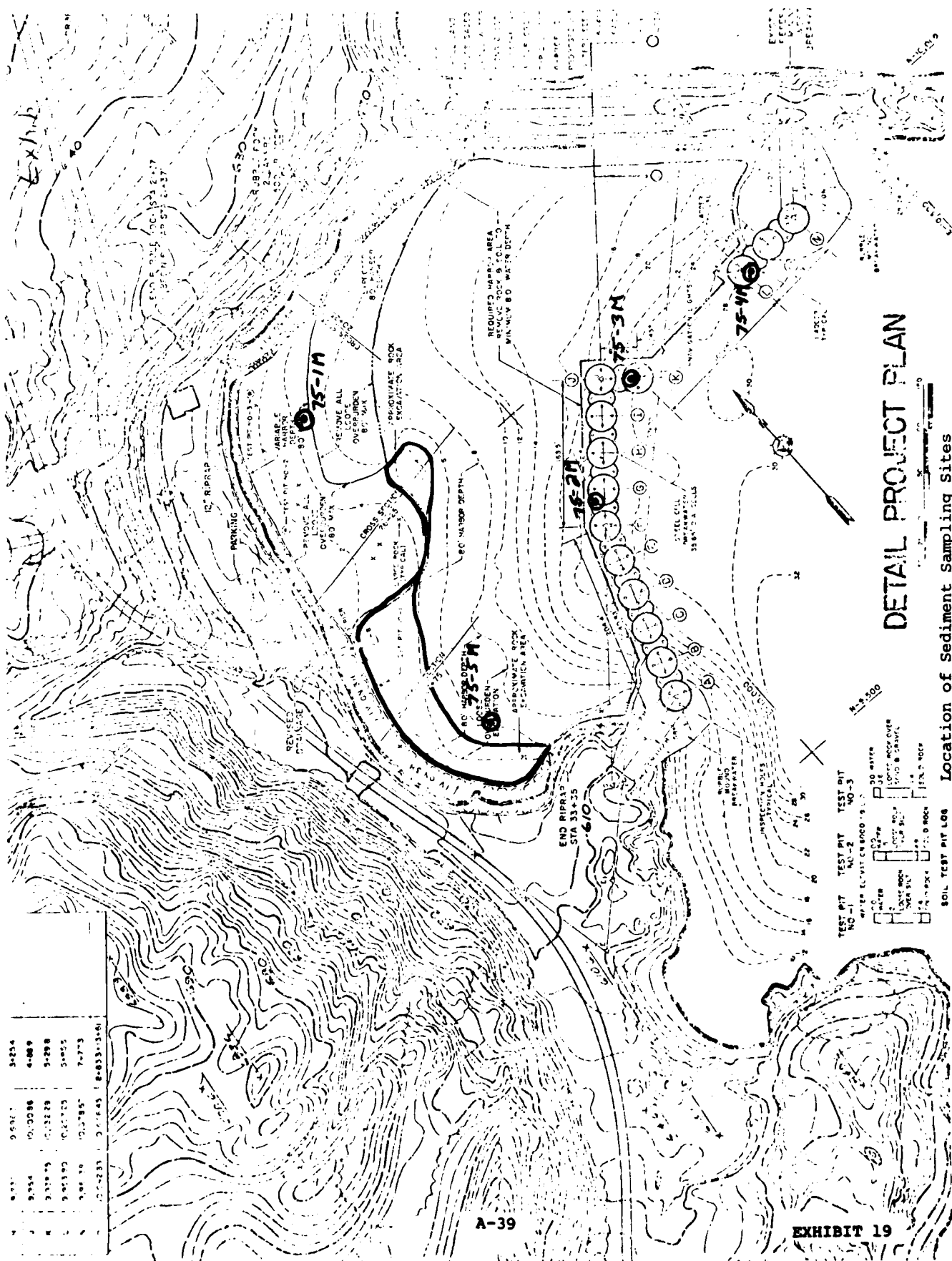
BATCH NO: 15

LAB NO:	43	44	45	46	47	48
SAMPLE SITE:	75-1M	75-2M	75-3M	75-3M	75-4M	75-5M
	S-1P	S-1P	S-1P	S-2P	1P	S-1P

ANALYSIS:

COD, Chemical Oxygen Demand, dry weight, mg/kg	5141	6925	6180	3388	6235	4126
Total Solids, %	89.0	87.1	77.4	89.7	83.4	85.7
Total Volatile Solids, %	1.6	2.2	1.9	1.7	2.2	2.5
Nitrogen, Kjeldahl Nitrogen, dry weight, mg/kg as N	133	213	250	211	229	124
Total Phosphorus, dry weight, mg/kg as P	588	455	402	458	378	351
Oil, dry weight, mg/kg	749	704	775	647	152	78
Polychlorinated Biphenyl (PCB), dry weight, mg/kg	0.023	<0.005	<0.005	<0.005	0.022	<0.005
Lindane, dry weight, ug/kg	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Heptachlor, dry weight, ug/kg	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Heptachlor Epoxide, dry weight, ug/kg	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Dieldrin, dry weight, ug/kg	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
p,p' DDT, dry weight, ug/kg	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
p,p' DDE, dry weight, ug/kg	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chlordane, dry weight, ug/kg	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Aldrin, dry weight, ug/kg	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Cadmium, dry weight, mg/kg as Cd	0.73	0.69	0.58	0.55	0.66	0.64
Total Chromium, dry weight, mg/kg as Cr	19	19	14	18	16	20
Lead, dry weight, mg/kg as Pb	10	10	7.7	9.4	10	10
Zinc, dry weight, mg/kg as Zn	54	61	45	48	43	48
Copper, dry weight, mg/kg as Cu	38	42	41	38	37	36
Nickel, dry weight, mg/kg as Ni	47	40	36	34	38	36
Arsenic, dry weight, mg/kg as As	<2.8	<2.8	<3.2	<2.8	<3.0	<2.9
Mercury (Bottom Deposits), mg/kg as Hg	0.026	0.097	0.032	0.018	0.030	0.028
Toxaphene, dry weight, ug/kg	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

1	0.75	9.50	3.25
2	9.54	10.00	4.00
3	3.75	7.25	3.25
4	9.50	7.25	3.25
5	9.00	10.75	7.75
6	10.25	7.75	8.50





United States Department of the Interior

FISH AND WILDLIFE SERVICE

Federal Building, Fort Snelling

Twin Cities, Minnesota 55111

IN REPLY REFER TO:

LWR

JUL 1 1976

Colonel Forrest T. Gay
District Engineer
U.S. Army Engineer District
St. Paul
1210 U.S. Post Office & Custom House
St. Paul, Minnesota 55101

Dear Colonel Gay:

This is in response to your March 25, 1976 letter requesting our comments on the proposed Lutsen (Schroeder) Harbor of Refuge relocated east of the Cross River.

We have inspected the proposed sight as outlined in your letter. Development of this harbor is not expected to have significant adverse impacts on fish and wildlife resources. We concur with the current plans indicating construction of rubblemound breakwaters, and excavation without blasting.

It is our understanding from a recent telephone conversation with John Forsberg of your Design Branch, that you presently intend to conduct onland disposal of materials dredged from the harbor. The possible disposal area outlined in the Detail Project Plan Map appears to be an acceptable site as we anticipate minimal adverse impact on the wildlife resources in this area.

As yet, the Environmental Protection Agency (EPA) has not classified the pollutional status of the proposed harbor area. As we indicated in our letter to you of February 20, 1975, we are opposed to the alternative of open-lake disposal of bottom sediments from the harbor until it is classified by EPA and agreeable disposal methods are determined. We would not object to using fill consisting of rocks and small boulders for lakeshore stabilization if the material to be used is classified by EPA as nonpolluted. We would appreciate the opportunity to comment on any changes or developments regarding the disposal method or disposal location of materials dredged from the proposed harbor site.

Sincerely yours,

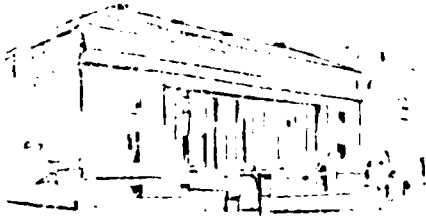
James B. E. Lohr
Acting Assistant Regional Director
Environment

cc: U.S. EPA, Chicago
Minnesota DNR



EXHIBIT 20

A-40



MINNESOTA HISTORICAL SOCIETY

690 Cedar Street, St. Paul, Minnesota 55101 • 612-296-2747

1 March 1977

Mr. Robert F. Post
Chief, Environmental Resources Branch
Engineering Division
DEPARTMENT OF THE ARMY
St. Paul District, Corps of Engineers
1135 U.S. Post Office and Custom House
St. Paul, Minnesota 55101

Dear Mr. Post:

RE: NCSSED-ER
Lutsen-Beaver Bay Harbor of Refuge
Vermillion River Flood Control

I have read both reports, and find both to be competent, professional efforts. The reconnaissance and assessment procedures described in the reports should have been entirely adequate to identify any cultural resources on or near the surface. The fact that archaeological resources were found at both Lutsen and at Hastings indicate that the procedures were adequate.

I would like to add two comments. Neither report adequately identifies the areas that were surveyed. While exact legal descriptions of areas surveyed are sometimes difficult to determine, written legal descriptions to the nearest quarter section would be useful. Likewise, a delineation of the survey areas on the appropriate 15 or 7.5 Minute USGS topographic quadrangles would help.

Secondly, the observation that deeply buried archaeological materials may occur in the Vermillion River floodplain is well taken. The Corps might well consider getting an opinion from a geologist before investing in a costly program of deep testing, however. A geologist might be able to determine the age of the gravel composing the floodplain. This information may be of critical significance in determining the need for further testing.

Mr. Robert Post

2

1 March 1977

Thank you for forwarding these reports to me and for your continued cooperation in preserving our cultural resources.

Sincerely,

A handwritten signature in cursive script, reading "Russell W. Fridley". The signature is written in dark ink and is positioned above the printed name and title.

Russell W. Fridley
State Historic Preservation Officer

RWF/fr

EIS C665

EXHIBIT 21

A-42



United States Department of the Interior

NATIONAL PARK SERVICE

INTERAGENCY ARCHEOLOGICAL SERVICES - DENVER
OFFICE OF ARCHEOLOGY AND HISTORIC PRESERVATION
1978 SOUTH GARRISON - ROOM 107
DENVER, COLORADO 80227

IN REPLY REFER TO

H2219-(RMR)PI

14 FEB 1977

Colonel Rodney E. Cox
District Engineer
U. S. Department of the Army
Corps of Engineers, St. Paul District
1210 U. S. P. O. and Custom House
St. Paul, Minnesota 55101

Attention: Mr. Robert F. Post
Chief, Environmental Resources Branch

Dear Colonel Cox:

Thank you for providing us with copies of "Cultural Resources Investigations Along the Vermillion River at Hastings, Minnesota", and "Archaeological Survey and Testing of Project Development Areas for the Harbors-of-Refuge at Lutsen and Beaver Bay, Minnesota", by G. Joseph Hudak. Per your request of January 31, 1977, our staff has reviewed the reports for purposes of providing the following comments:

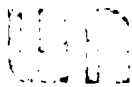
We believe Mr. Hudak's efforts at resource identification were reasonably thorough, and the largely negative results of the investigations are supportable. However, we concur in his consideration of the possibility of deeply buried remains in the flood plain of the Vermillion River. We believe his recommendations for the field checking of any deep excavations warrant serious attention.

Thank you for providing us with the reports and the opportunity to comment, we look forward to your continued cooperation in historic preservation.

Sincerely yours,

Jack R Rudy
Chief, Interagency
Archeological Services - Denver





UNIVERSITY OF MINNESOTA
TWIN CITIES

Department of Anthropology
215 Ford Hall
224 Church Street S.E.
Minneapolis, Minnesota 55455

February 14, 1977

Mr. Robert F. Post, Chief
Environmental Resources Branch
Engineering Division
St. Paul District, Corps of Engineers
1135 U.S. Post Office and Custom House
St. Paul, Minnesota 55101

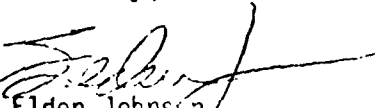
Dear Bob:

Thank you for sending me copies of the reports by G. Joseph Hudak, Science Museum of Minnesota, on the investigations along the Vermillion River near Hastings, Minnesota, and the investigations in the harbors-of-refuge areas at Lutsen and Beaver Bay, Minnesota.

Both surveys meet what I would consider professional archaeological field survey standards. I find the reports clear, the recommendations well documented and the evidence for those recommendations sufficient.

I might note that it would be desirable to require that all future reports contain an exact quotation of the scope of work under which the work was done. Hudak does this for the Beaver Bay-Lutsen report and paraphrases the scope for the Vermillion River report. Doing so enables a reviewer to assess the quality of the report with more confidence.

Sincerely,


Elden Johnson
State Archaeologist

EJ:d1
cc: Russell Fridley
G. Joseph Hudak



DEPARTMENT OF THE ARMY
ST. PAUL DISTRICT, CORPS OF ENGINEERS
1135 U. S. POST OFFICE & CUSTOM HOUSE
ST. PAUL, MINNESOTA 55101

REPLY TO
ATTENTION OF:

NCSED-ER

8 August 1977

Mr. Russell W. Fridley
State Historic Preservation Officer
Minnesota Historical Society
Fort Snelling Branch (Bldg 25)
St. Paul, Minnesota 55111

Dear Mr. Fridley:

The cultural resources survey at Beaver Bay, which was conducted by the Science Museum of Minnesota, under contract with the St. Paul District, identified the wreck of the ship Hesper in the harbor area. Although this wreck is not located directly within the project right-of-way, the dredging and blasting involved in construction of the harbor-of-refuge could have an adverse affect on the remains of the vessel. The information obtained by our contractor suggests that the ship remains may have historical significance and therefore is potentially eligible for inclusion on the National Register of Historic Places.

In compliance with the National Historic Preservation Act of 1966 and Executive Order 11593, we are requesting that you review your available information regarding the Hesper shipwreck and provide your opinion regarding its eligibility for inclusion on the National Register of Historic Places. If the information that you have is not sufficient to make this determination, please inform us as to what additional information is required. Also, please advise us of your opinion of the potential impacts, if any, on the Hesper of blasting to deepen other areas of the harbor.

We would appreciate your response by 24 August 1977 so we can include it with revisions to the Final Environmental Impact Statement.

Sincerely,

ROBERT F. POST
Chief, Environmental Resources Branch
Engineering Division



MINNESOTA HISTORICAL SOCIETY

Fort Snelling Branch (Building 25) Fort Snelling, St. Paul, Minnesota 55111 • 612-726-1171

September 30, 1977

Mr. Robert Post
Chief, Environmental Resources Branch
Engineering Division
DEPARTMENT OF THE ARMY
St. Paul District, Corps of Engineers
1135 U.S. Post Office and Custom House
St. Paul, Minnesota 55101

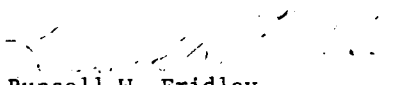
Dear Mr. Post:

Re: NCSED-ER
Ship Wreck "Hesper" at
Beaver Bay, Minnesota

The project described above has been reviewed pursuant to responsibilities given the State Historic Preservation Officer by the National Historic Preservation Act of 1966 and the Procedures of the National Advisory Council on Historic Preservation (36CRF800).

I have been informed during discussions with archaeologists of my staff that portions of the "Hesper" have already been covered during construction of the present breakwater, seriously damaging the integrity of the vessel. The exposed portions of the ship have little interpretive value. Therefore, the ship wreck "Hesper" is not eligible to the National Register of Historic Places.

Sincerely,


Russell W. Fridley
State Historic Preservation Officer

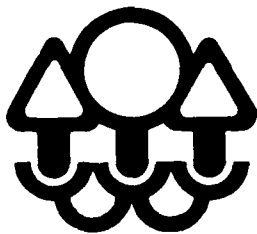
RWF/jr

EIS 665

EXHIBIT 25

A-46

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Minnesota Pollution Control Agency

DEC 26 1977

Mr. Roger G. Fast, Chief
Engineering Division
U.S. Army Corps of Engineers
1135 U.S. Post Office and Custom House
St. Paul, Minnesota 55101
Attn: NCSED-ER

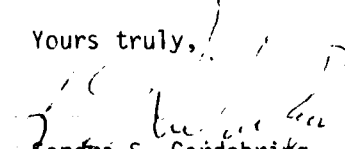
Dear Mr. Fast:

This is in response to your letter dated November 9, 1977, in which you request that the Minnesota Pollution Control Agency (MPCA) evaluate the acceptability of the proposed on-land disposal of dredged material for the Lutsen (Schroeder) and Beaver Bay (Silver Bay) harbors of refuge. Based on our review of the information supplied to date we have no objection to the proposed disposal methods provided that:

1. The dredge material be placed and landscaped to conform with the general topography of the area.
2. Temporary and permanent erosion protection measures be provided when necessary to prevent unwanted siltation or return of dredge material to the lake.
3. The Corps be prepared to take necessary mitigative measures to prevent lake or groundwater degradation if unforeseen water quality problems arise.

The MPCA approves of on land disposal of dredge spoil and we foresee no problem with the methods you have proposed. However, the Lake Superior area is an important State and National resource and every effort must be made to mitigate the aesthetic and environmental impacts of this project. We request that you continue to inform us of your plans for construction of these harbors and if you have further questions regarding our position, please contact me or Mr. Louis Flynn (296-7225) of my staff.

Yours truly,


Sandra S. Gardebring
Executive Director

SSG:pa

EXHIBIT 26

A-47



UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION V
25 SOUTH DEARBORN ST.
CHICAGO, ILLINOIS 60604

Mr. Roger [redacted]
Chief, [redacted] Division
U.S. Army Corps of Engineers, St. Paul
1135 U.S. [redacted] Office and Custom House
St. Paul, Minnesota 55101

Dear Mr. [redacted]:

Thank you for your letter of November [redacted] and the material and plans for the proposed [redacted] (Schroeder) Beaver Bay (Silver Bay) [redacted] approval of the disposal method for these [redacted] had given approval of the two sites [redacted] conversation on July 18, 1977.

The site [redacted] for the disposal [redacted] should not [redacted] any adverse impact [redacted] area [redacted] would be no problem [redacted] into the [redacted] water. Since [redacted] the surface [redacted] this for [redacted].

In regard to the Lutsen site, the [redacted] soils are [redacted]. The sediment [redacted] Lutsen [redacted] high levels of [redacted] in your [redacted] we gave verbal [redacted] have been [redacted]. The [redacted] of the [redacted] causes us to have [redacted] potential [redacted] groundwater intrusion [redacted] the potential for groundwater intrusion [redacted] should be [redacted].

We appreciate your coordinating these [redacted] for our [redacted] for the Lutsen site at this date [redacted] in regard to our comments, please contact Mr. [redacted].

Sincerely,

Susan P. Walker, Chief
Environmental Impact Review Staff
Office of Federal Activities

EXHIBIT 26

DATE
ILME